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ABSTRACT

Twelve papers from the 1979 International Symposium on Early Identification and Intervention Practices focus on theoretical perspectives as well as on implications and applications. The following titles and authors are represented: "Perspectives in Early Identification and Intervention--Keynote Address" (V. Shipman); "Preschool Screening--Ready? Set? Go!" (J. Palfrey); "Problem and Promise in Early Identification--Children with Special Needs" (G. Morgan); "Early Identification and Intervention" (S. Wolfendale); "The Prediction of Reading Failure--A Review and Critique" (A. Silver); "The Risk of Normality" (R. Sumner); "Identification and Intervention--A European, Particularly Scandinavian, Perspective" (K. Stukat); "Problems of Prediction in Early Identification" (G. Morgan); "Some Issues in the Implementation of an Early Identification Procedure" (T. Bryans); "The Development of a Screening Procedure for an Early Education Project--The Pediatric Examination of Educational Readiness (PEER)" (J. Palfrey); "The Windsor Early Identification Project Revisited" (K. O'Bryan); and "Monitoring the Child's Learning Style" (D. Stott). (SB)

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Early Identification & Intervention

Selected Proceedings from the Fourth International Symposium on Learning Problems, Toronto 1979

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Early Identification & Intervention

Selected Proceedings from the Fourth International Symposium on Learning Problems, Toronto 1979

Edited by
Harry Silverman
Iain F. W. K. Davidson
Laura S. Weintraub

The opinions expressed should be
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FOREWORD

Providing appropriate education to children with learning disabilities has concerned special educators for the past thirty years. Recently, increased emphasis has been on early identification of these learning problems. It is postulated that once such "deficiencies" are identified in a child, a specific program of prevention/treatment may be undertaken. With proper identification and intervention procedures, it is possible to meet the needs of children who do not readily satisfy the school's standards of education and behaviour. The earlier the program is begun, the greater are its chances of success in preventing later academic failure.

Although the early identification of "at risk" children indicates a need for a standard of categories of exceptionality, the development of preventive educational strategies is not the clear-cut, direct process it is often assumed to be.

The current approach, and even the language of identification work, is clinical rather than educational. Since the purpose of early identification is to provide information directly helpful to teaching, it is proposed by the editors that testing follow an educational instead of a clinical model. Further, Keogh (1976) points out that standardized psychometric tests tend to categorize and group rather than individualize children on *educational* grounds. He argues that, given the dubious validity of many such tests, plus the time and expense required for their performance, alternative approaches to early identification merit serious investigation.

AGE AND VARIATION

The word "early" holds different connotations for different members of the teaching community. Educators generally associate the term with the months surrounding entry into kindergarten, whereas for day nursery personnel it often refers to children two to three years of age. Whichever time frame is used, the criteria for "at risk" identification procedures need to be clarified. What, specifically, are the behavioural signs, characteristics, and difficulties we should be looking for, and at what optimum ages?

The problem is to determine at which stage intensive identification procedures are best applied, whether at the preschool period or at initial entry to the formal school setting. In the former situation, we are forced to deal with assumptions: (1) that the functions we are attempting to identify will be critical in subsequent learning, and (2) that these malformed characteristics will eventually crystallize unless subjected to immediate testing and intervention. However, since the model for normalcy is itself still in question, testing results and processes at this stage must involve, at least in part, a degree of speculation.

The next level, children who are in school, provides a situation which is more directly applicable. The teacher knows and can observe the children in the actual learning situation; it is then relatively easy to devise procedures for classroom-based information to be collected and analysed over a period of time.

A child's educability in school encompasses a complex, multifaceted process, composed of, among other elements, cognitive abilities, earlier experiences, parent-child and sibling-child interaction, curriculum, and teaching style and ability. To assume that the reasons for a child's learning disabilities are tied only to inner deficiencies is unrealistic; the dynamics of interaction between the child and the learning situation accounts for a substantial number of school learning problems, and many of these can only be observed within the school setting.

Also to be considered are the consequences that may be imposed upon children designated as "at risk" cases. Although concern for a particular child may result in useful identification strategies at any age, concern may also lead to an overemphasis upon certain (presumed) weaknesses; a child can quickly become anxious and unsure in such circumstances. This is more likely in children of preschool or kindergarten years, who are most vulnerable to these anxieties, and whose apparent learning difficulties may only be temporary gaps or weaknesses misinterpreted through standardized testing procedures.

POST-IDENTIFICATION

The early developmental review procedure envisaged by the editors would use direct observation and ratings of children's classroom behaviour and performance and a description of the instructional program, as important types of early review information. This, in turn, would permit the identification of the child's learning strategies and characteristic ways of approaching learning tasks, leading simultaneously to the development of individualized programs. By emphasizing the global functioning of each child--in both positive and negative aspects--the deficit orientation based on the more clinical model would be avoided.

Such a procedure would allow teachers to pinpoint areas of performance requiring closer monitoring and further intervention procedures. A close liaison between the classroom teacher and another party--a consultant, perhaps, or an early identification teacher/assessor not directly involved with the class--would provide a useful balance, especially in the analysis of teaching and materials. Such "teamwork" would also help to eliminate the investigative bias occurring in some areas of testing.

THE CONFERENCE AND PROCEEDINGS

Against the background of these considerations, the idea for the International Symposium on Early Identification and Intervention Practices evolved. It was held in Toronto in mid-1979. Making the Conference international provided the opportunity to compare and consider various identification and intervention ideas and practices in differing educational systems.

It is impossible to publish all the presentations made during a very full symposium. However, the objective is to provide a representative selection of perspectives and procedures regarding early identification of children's abilities and disabilities. Some approaches, specific techniques, and cautions are also offered in further detail.

REFERENCES

Keogh, B. (1976). "Early identification of children at risk for educational programmes". In Wedell, K., and Raybould, C., *The Early Identification of Educationally At-Risk Children*. Edglaston, Birmingham: University of Birmingham.

ACKNOWLEDGEMENTS

The editors would like to express their deep appreciation to the individuals who participated in the Symposium, and especially to those who contributed to this volume. We also wish to thank those who provided essential and valuable insights from the perspective of the local school boards. Appreciation is due, as well, to the many people who chaired and who recorded the discussion groups and workshops. We are indeed grateful for their efforts. The Conference Office and the Audio-Visual Department of the Ontario Institute for Studies in Education were largely responsible for the smooth running of the Symposium.

We also acknowledge our indebtedness to the members of the joint Ontario Institute for Studies in Education-Ministry of Education Planning Committee for their efforts in making the Symposium possible. Finally, our thanks are due to the Ontario Institute for Studies in Education and the Ontario Ministry of Education for their assistance in ensuring the publication of the Proceedings.

H.S.
I.F.W.K.
L.S.W.

SECTION ONE

THEORETICAL AND COMPARATIVE PERSPECTIVES

1 THEORETICAL AND COMPARATIVE PERSPECTIVES: INTRODUCTION

The papers in Theoretical and Comparative Perspectives address the concepts of early identification and intervention from a general theoretical and empirical perspective. While professional orientations and emphases differ from paper to paper, certain common themes are evident.

For example, Shipman, on the basis of reported research projects and general United States experience, suggests that cautions must be exercised with regard to the interpretation of reported incidence data pertaining to various exceptionalities. She argues against a search for deviation but emphasizes the need to assess, over time, the ongoing process variables related to the child in the learning environment, due to the variability of the performance of young children. She thus challenges the typically used approach of assessing only the child to determine potential for success or failure.

Similarly, Palfrey, from a paediatric point of view, urges caution and scepticism in the acceptance of the applicability and usefulness of preschool developmental screening procedures for which she offers a series of objective criteria. In discussing these criteria, Palfrey underlines the dangers inherent in prediction, the problems of validation of instruments, and the hazards of overidentification.

Similarly, Morgan also emphasizes the impracticability of predicting school success or failure and argues for the need to focus attention on the whole child-environment interaction in order to pinpoint the child with special needs. For Morgan, "the concept that early identification should deal with all children and be firmly rooted in developmental perspective is . . . an extension of the concept of special needs."

The next paper in the series, that by Wolfendale, traces the common threads that can be discerned in approaches to early identification in the United States, Canada, Australia, Europe and the United Kingdom and then concentrates on the major influences, past and present, on procedures in the U.K. She describes her work with Bryans regarding the aims of intervention, and presents examples of other types of programs currently being studied or used in the United Kingdom.

A contrasting perspective to those presented in the preceeding papers is that of Silver, who outlines the heterogeneity of aetiology and the wide diversity of symptomatology of children with reading problems. He then focuses on the prevention of reading problems through primary prevention, involving social and education change, modification of prenatal and obstetrical care; and secondary prevention, involving early diagnosis in the kindergarten years of children found vulnerable to failure, and intervention to correct the immaturities revealed.

Using a conceptual analysis of early identification and intervention programs and a critical analysis of statistical measures used in England and Wales, Sumner rejects the deficit model but stresses instead the dynamic interaction between child variables and environment/program variables in understanding how children learn or may be assisted to learn. He emphasizes, as did Shipman, Morgan, and Palfrey, the interaction between the learner and the material to be learned, paying particular attention to the structural features of the knowledge task.

Finally, Stukât provides a summary of research studies conducted in Western Europe and outlines the general trends in European thinking in relation to early identification and intervention. According to Stukât, greater emphasis is placed in Europe on intervention than on identification. Compensatory programs introduced as a result of the research findings are described, and Stukât suggests that there appears to be a trend in the direction of looking more at social and educational factors rather than individual child factors in the planning of such programs, an important theme which emerges in several of the papers.

PERSPECTIVES IN EARLY IDENTIFICATION AND INTERVENTION: KEYNOTE ADDRESS

Dr. Virginia C. Shipman

INTRODUCTION

I bring you greetings from your neighbour to the south, and am delighted to be here. I had the privilege of being with the Canadian Association for the Education of Young Children in Winnipeg last fall, and I'm delighted to continue this association with Canadian colleagues and friends.

Despite the passage of Public Law 94-142 in 1975 (United States, 1977), requiring schools in the United States to identify all handicapped children up to the age of twenty-one, the American Bureau of Education of the Handicapped indicates that there are as yet many unidentified and unserved handicapped children in American schools, in comparison with most estimates of prevalence. Additionally, the Bureau's recent report to the United States Congress suggests that numbers of children thus identified and served vary not only because of differences in definitions and eligibility criteria among the states, but also because of differences in assessment procedures, availability of services, and methods of locating services.

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* Dr. Shipman, who has conducted extensive study in the field of child development and educational intervention, was the Keynote Speaker of the Fourth International Symposium on Learning Problems. She is currently with Educational Testing Service and Princeton University.

In looking closely at these figures, some interesting trends emerge regarding the results from assessment procedures. Perhaps there is something we have not suspected about the waters of the Atlantic Ocean, especially in the south-east of the United States, as that region is where the high incidence statistics occur for children reported to be mentally retarded. In the Pacific area, however, where there is a California moratorium on intelligence testing, children are unlikely to be mentally retarded. Chances of being mentally retarded increase in Mississippi, whereas emotional disturbance is more likely for Utah children. We must be alert to what these and similarly misleading diagnostic figures say about our present state of the art of identification and service on behalf of handicapped children. We must also be alert to the implications of what we mean by the terms of "early identification" and "intervention" as we use them during this Conference. Here we are talking about the early identification of needs, and not, I must stress, the early identification of a particular kind of child.

As a preamble to reporting to you about research I am currently conducting, I would like to raise some questions which should help to emphasize the importance of thinking about the linkages between what some of the research is saying and what some of our practices are. First of all, keeping in mind the current discrepancies between prevalence estimates and handicapped children actually served, we must assess the benefits and costs of screening. We must ask what the specific purposes are for screening. What are we trying to find out? Are we doing it to get a count? To obtain a certain amount of funding?

A second and much more important series of questions we must ask ourselves is what are we going to do with the information? Is the gathered information a mere survey? Are there particular programs available geared to the kinds of needs that have been identified? Too often we identify, we label, but we have no practice, no ongoing intervention to match. Perhaps we can ask ourselves the difficult question of why we are identifying, at high cost, something about which we really don't know what to do.

Thirdly, we must investigate the measures themselves, particularly in light of the plethora of measures developed in the last few years, as early childhood education has received more effort, focus and funding. What are we using? What do we know about the measures? Who has selected them, and has there been a variety of input into that selection? What kinds of information are we going to get? What kinds of reliability do the measures have? What is the validity, and what kinds of validity? Is it valid for the particular population for whom the test is being used, or for a particular technique? How do test performances change over time, and what do the tasks mean for children of different ages? What information do we have about ecological validity? These are some of the harder questions that people in the measurement field are asking. Unfortunately, in the early education field, such questioning has been slower in coming about.

IMPLICATIONS OF IDENTIFICATION

As we keep in mind all these questions regarding the purposes, function and validity of early identification, there are a number of other points we must be aware of. Firstly, prediction is not determinism. Testers, teachers, administrators, parents and children themselves must be trained to tread carefully in order to avoid the confining and limiting prophecies that have beset the psychoeducational field. Secondly, a transactional--as opposed to interactional approach--is crucial. Here, a "building block" notion of dynamic transactions (Sameroff, 1975) appears to provide the most adequate conceptualization of interrelationships that lead to new non-linear patterns in the child's development. For example, parents in early interaction tend toward socializing the child in the direction of certain behaviour patterns. The child then enters school where a teacher and other children react to that child in certain ways, whose new behaviours are brought back to the parents, who in turn react differently toward the child, and so on.

Thirdly, it is important to assess ongoing process variables for informing practice. Too often in the past our measures have given us static scores providing little information for the teacher in the classroom, for the child her/himself, for other children, for the parent, for the agency person. The scores give little information about how a particular behaviour came about, the child's orientations or style of interaction, in sum, what the processes are. By looking at process variables--the styles of learning, for example, or the emotional-affective responses, the patterns of behaviour--we can ascertain the kinds of descriptive differential assessments that can inform practice.

Fourth, we want to talk about continuity and co-ordination. Here we mean continuity and co-ordination between home and school; between preschool and grade school programs; between special class and regular class programs; and amongst the various agencies supposedly serving the family. We must also bear in mind that to continue to meet the child's developmental needs, continuity may necessitate change, and not continuation of experience. To what extent do we have continuity and co-ordination amongst the varying environmental influences that are acting upon the child so that we may facilitate the most appropriate educational strategies?

Fifth, in recognizing the child as a whole person, assessment and program planning must take into account the interrelationships among cognitive, affective and social behaviours. The identification of a particular skill when it is embedded in other kinds of motivational and affect systems has differential implications for the kind of program planning one does.

And finally, throughout our contacts with the child, our assessments must be informing and directed to serve, to identify needs, and to help. In using techniques for early identification, measures may appear to be reliable, they can show certain kinds of validity, but we must use our common sense to stop, look at them, and be willing to say, "Hey, this is wrong". For example, there is a measure that asks of the teacher "In what ways does this child differ from normal children?"; every item identifies the extent to which the child deviates from the "normal" child. Now why should there have been the assumption that a child who has been designated for special education services is different from a "normal" child in social or affective behaviours? This is not identifying needs, and is not helping parents, teachers and others serving the child. We must emphasize needs, not pathology; strengths not disabilities. I hope you will find some of these points exemplified in the research findings that I would now like to discuss.

A LONGITUDINAL RESEARCH STUDY

The section of the longitudinal researches[1] that I am reporting on today is a study of predominantly low-income children whose development we have been following since their age of approximately three-and-a-half years. The children are now in eighth grade, and today we will examine a particular focus of a particular sub-sample of that population. The findings in this report should be relevant to the current controversy regarding early identification and screening of preschool children. Intensive study of observer ratings and test performance obtained during the age period three-and-a-half to five years should indicate the extent to which assessment of cognitive, perceptual, affective and social functioning in preschool low-income black children (a group who in general can be classified as "at risk" with regard to functioning successfully in school) can serve, first, to identify early those areas of functioning needing remediation, and second, to suggest individualized modes of treatment. Equally important, the findings may suggest early indices of gifted functioning.

The Educational Testing Service (henceforth referred to as E.T.S.) Longitudinal Study of Young Children and Their First School Experiences focuses on two basic questions. What are the components of early education that facilitate or interfere with the cognitive, personal and social development of disadvantaged children? What are the environmental and background variables that moderate these effects, and how do these moderators produce their influence?

It is well established that children from low socio-economic status families generally do not achieve academically as well as middle-class children. (It is important to note that we are talking about academic skills here, and not cognitive behaviour; they are not equivalent terms.) While a number of researchers have related this finding to various aspects of the differing environments of lower- and middle-class children, there is considerably less evidence describing environmental factors associated with performance differences solely within an economically disadvantaged population. Data from the third grade children from the Longitudinal Study indeed confirm the existence of wide ranges in cognitive aptitude and academic achievement among children of relatively homogeneous socio-economic status. To further our understanding of development and to contribute to the planning of environments to facilitate that development, it is obviously of critical importance to discover the unique characteristics of children and their environments that do not fit the generalization that low social class equals low achievement.

Analysis to date of the massive amounts of data collected has been focused on examining relationships among various large sets of information from particular domains. In these investigations an attempt has been made to examine the consistency of findings across several categories (for example, the child's sex and race, family socio-economic status, and geographical location). But one of the frustrations experienced in doing large-scale research is the impersonal aspect of such group analysis and the consequent decreased awareness one has of individual study participants. Every so often, for example, one hears a tester's or a teacher's salient comment about a particular child. But to a large extent the individual developmental histories of study children remain unknown to the researcher who, to operate efficiently and in accord with relevant models, must constantly reduce the data collected into a limited set of variables.

Given the multiple and interacting nature of influences upon any behaviour and the error contained in any measurement technique used, the magnitude of correlation obtained between psycho-social variables and the young child's functioning is understandably moderate at best, accounting for only a small amount of the behaviour examined.

Moreover, we do not know the extent to which various aspects of the child's development are appropriately assessed by statistical models that assume a linear growth model. The present study was an attempt to generate hypotheses concerning those combinations of factors which enhance or interfere with the child's early grade school performance.[2]

SAMPLE SELECTION

Intensive case studies were prepared for those study children who, on a grade achievement test, were firstly, significantly above or below the average performance for children of similar ethnic and income status in basic school skills of reading and math; and secondly, significantly deviant from the level predicted by their performance on a test of pre-academic skills at age four. By multiple analytic strategies we hope to contribute to the further understanding of the complex interacting influences upon children's development so as to provide a basis for informed socio-educational intervention.

In brief summary of several sample selection criteria, I should note that in the fall of 1968 four regionally distinct communities were selected which had sufficient numbers of children in grade school and in the Head Start program, appeared feasible for longitudinal study given expressed community and school cooperation and expected mobility rates, and additionally, offered variation in preschool and primary grade experiences. The study sites chosen were Lee County, Alabama; Portland, Oregon; St. Louis, Missouri; and Trenton, New Jersey. Within these communities, elementary school districts with a substantial proportion of the population eligible for Head Start were selected. In each school district an attempt was made to test all non-physically handicapped, English-speaking children who were expected to enroll in first grade in the fall of 1971 (that is, children of approximately three-and-a-half to four-and-a-half years of age).

The current analysis focused on children from the longitudinal sample (that is, those who were tested or their mothers interviewed during the first year of the study) who were below the 1969 Office of

Economic Opportunity poverty guidelines, as determined by the parent interview given during the year Head Start was available to study children. Since the number of white families in the study meeting these criteria was relatively small, only black children were included to eliminate the possibility of racial confounding. Scores on the Cooperative Primary Tests[3] during the sixth year of the study were necessary to define the extreme groups, which markedly reduced the size of the sample available for this analysis, since achievement tests were administered only in target classrooms (that is, classes with fifty percent or more study children who had been previously tested). Thus, the sample for this particular report I am sharing with you consisted of black children from Head Start eligible families who were identified at the study's start-up and had scores available on the Cooperative Primary Tests given in the sixth year of the study. This group, henceforth referred to as the "total sample", consisted of one hundred boys and eighty-six girls. From this economically disadvantaged sample, the highest and the lowest achieving children were selected by several different methods and criteria.

ASSESSMENT STRATEGY

To achieve the broad goals of the study, the assessment strategy required selection of a variety of measures that would help describe more adequately the complex interrelationships and structures of children's abilities and characteristics over time, and also permit determination of their interaction effects with particular preschool and primary grade programs. Measures encompassing objectives claimed by preschool and primary grade programs were included along with measures of development that social science frequently holds as important for human functioning. Measures were included, as well, that would help delineate basic cognitive, affective, and social processes and their courses of development. Tasks were selected to allow continuity of measurement across age periods, through the use of vertically equivalent forms over time, and multiple measurement of the same variable (within a context) across several age periods so that possible developmental shifts in expression could be monitored.

Process rather than static variables were emphasized, especially those process variables involving parent-child and teacher-child interactions, such as modes of information processing and reinforcement strategies. To whatever extent possible, measures were included which tapped functional characteristics or perceptual styles affecting learning, such as individual differences in ways in which children approach a task, kinds of clues selected, strategies of organization, speed of decision and response, persistence and so forth. Implicit throughout was the belief that only for the intermediate purpose of structural analysis and derivation of measures within domains could one separate cognitive, perceptual, social and affective domains, or study the child without taking environment into account.

We now should identify the six major variables toward which these information gathering efforts have been directed: (1) the family, with focus on both status and process variables (that is, those variables describing what the family is--ethnic membership, occupational level--and what it does--the mother's teaching styles with her child and her attitudes towards schools and the learning process; (2) the teacher, including such items as background characteristics, attitudes, abilities, and teaching goals; (3) the classroom, with focus on both program components and teacher-child and peer relationships; (4) the school, including physical characteristics and organization as well as relationships between teachers and administration; (5) the community as well; and, finally (6) the child, using the largest percentage of measures included, designed to tap several aspects such as health information, cognitive, perceptual-motor, affective, and social development.

I also should mention, regarding methodology, that we believe emphatically that research is an involved partnership shared between the people who are the participants in the study and the researchers. Just as the family and the child her/himself must be primary collaborators in any kind of school program, so too all our testers, observers, interviewers (local community members trained to act as paraprofessionals) and study subjects are collaborators in our research endeavours.

MULTIPLE DETERMINANTS

An intensive examination of the derived case study materials revealed the multiple determinants of academic success or failure; on first reading, each child's record appeared to have a unique history of causal antecedents. Among the many child, family, and school variables examined, no one score or composite of scores was consistently associated with level of academic achievement. When examining the extent to which children were categorized as exceptional according to geographical region, family structure, sex, and preschool attendance, only consistent differences according to site were evidenced, with more children from Lee County doing poorly and more children from Portland doing relatively well in reading and math. However, the extent to which site differences reflect differences in initial sample characteristics, or in geographical region, urbanness, preschool teacher certification, preschool program sponsor, and age of preschool entry (all of which are confounded with site in this sample) or other unmeasured relevant variables is unknown. Since most of these Head Start eligible children had actually attended Head Start, preschool experience *per se* did not differentiate high- and low-scoring children. However, in checking those children who had been retained in first or second grade, a more severe index of poor school progress, a higher percentage of children who had not attended preschool was found. Moreover, for those Head Start children who later attended a Follow Through program, the data suggested the positive impact of continued broad comprehensive services to the children and their families.

When examining teacher background characteristics (such as age, years of schooling, and amount of teaching experience), it was found that at any one grade level most teachers had children in both the high and low categories. Gross school variables such as school size, class size, and percentage of minority students also revealed no consistent differences, although there was a trend for schools with more support staff to have more children in the high-achievement groups. Such findings point to the importance of investigating specific teacher-child interactions for understanding school effects.

Correlations obtained between a selected group of family status, situational, and process variables and the child's designation in high or low reading and math groups indicated that even within this restricted socio-economic status sample of economically disadvantaged families, differences in parental educational level, physical resources in the home (that is, the amount of material possessions, the extent of physical crowding), and encouragement of school-relevant skills and attitudes (for example, frequency of reading to their four-year-old child, level of educational aspirations and expectations) were associated with the child's later school progress. Similar findings were obtained by Greenberg and Davidson (1972) and Stedman and McKenzie (1971) in their research with high- and low-achieving low socio-economic status urban northern black and southwestern Mexican-American children, respectively. Low-income families are not a homogeneous group. The lack of association obtained between parental occupational status and children's academic achievement again highlighted previous reported study findings (Shipman et al, 1976) on the apparent different meaning of this variable for black and white families.

These data are consistent with the extensive research literature on the important relationship of early home influences to the young child's school performance (Bronfenbrenner, 1974; Hanson, 1975; Hess et al, 1969; White et al, 1973). Although status, situational and process variables may share considerable commonality in their prediction of the child's subsequent reading and math performance, the process variables help provide important explanatory information and programmatic clues that are not obvious from status characteristics alone. As was pointed out in a recent extensive discussion of relationships among family status, situational, and process variables and children's academic achievement (Shipman et al, 1976), status characteristics may be viewed as providing differential opportunities for various processes to emerge. Thus, for example, a higher level of parental education is associated with greater academic knowledge, increased awareness of public affairs and popular culture, more informed perceptions of school, and continued seeking of new knowledge as in reading books and magazines (Hyman et al, 1975), all of which may have impact on the child's knowledge and motivation for learning. In addition, by providing differential opportunities for the parents' participation in society, there may be indirect effects upon the child via parental attitudes and child-rearing behaviour acquired through such experiences. A second example of the interrelatedness of status, situational, and process variables is the commonly found association between low economic status, high household density, and parental use of physical punishment with their children. These negative effects of crowding have been shown to be exacerbated by additional stresses in the home (Booth & Edwards, 1976). Family process variables are thus considered as the underlying mechanisms by which child outcome differences associated with family status characteristics are created and maintained.

PRESCHOOL MEASURES

A variety of measures of the child's functioning at age four were found to be useful in identifying children likely to do well or poorly during the course of their acquisition of basic school skills of reading and math. Such measures were not limited to those in the cognitive-perceptual area, but included tasks assessing affective behaviour (for example, self-esteem, cooperation) and cognitive styles (such as reflectivity). These findings suggest that a number of preschool measures of a child's cognitive, affective, and social functioning may indicate early strengths and weaknesses relevant to the child's later school functioning, perhaps in part due to their reflecting children's differential responses to early intervention. Further analyses of data collected at ages five and six are likely to suggest other important areas of inquiry, with some measures not found to be differentially predictive at age four then becoming so at a later developmental stage.

The positive use of such measures as initial screening instruments to provide guidance for tailoring programs to meet children's needs should be emphasized, as contrasted with their use in making placement decisions which may act as self-fulfilling prophecies. Preschool assessment can facilitate the provision of programs geared to the individual needs of children rather than those planned on the basis of ascribed needs of children according to various status characteristics.

But a major conclusion from these data is that these family and child variables are not necessarily associated with exceptionally high or low academic achievement; for any one of these variables or a composite of home or child variables much of the variance in individual scores remains unaccounted for. Also, the correlations do not provide rationales for the degree of association obtained. Thus, to obtain clues to the nature of moderating variables it was decided to study intensively those children who showed the greatest absolute deviation in cognitive-perceptual performance, whether in a positive or negative direction, thereby taking into account potential interactions among family, child, and school variables and also differential sequences of school experiences.

INTERACTION OF VARIABLES

The emerging causal hypotheses derived from this intensive case study approach may be grouped into three major categories of locus of change: the child, the home, and the school. Within each of these broad classifications, a number of subcategories can be derived. For example, change in the child's cognitive-perceptual performance can be viewed as a function of change in the child's physical well-being (for example, a serious illness or accident leading to sensory impairment and/or absence from school, remediation of an interfering defect, gradual "catch up" with developmental lag arising from premature birth); emotional status (for example, becoming more or less shy and inhibited in responding to an unfamiliar adult in a testing situation, being more or less willing to attempt a response when the questions become more difficult); motivation (for example, changes in the child's valuing of school performance, in his or her expectations for success in performing school tasks, and in his or her enjoyment in the school situation); and in general cognitive strategies (for example, changes in ability to attend, reflect upon, differentiate). As the case studies in the research indicated, however, rather than acting in any simplistic compartmentalization, these changes in the child's functioning should be viewed as dynamic interdependences among physical, affective, social, and cognitive behaviour. For example, for some children, preschool attendance appeared to affect most their self-confidence and ease in relating to others; these changes in personal and social variables later enabled them to attend better and assimilate academic instruction. For others, acquisition of new pre-academic skills in preschool appeared to be causally related to their increased social and affective competencies.

Nevertheless, except for one child for whom a serious accident did seem to account for the striking decrement in performance, the above postulated changes which were evidenced in the case histories examined could not be viewed as sufficient causes. Examination of other case histories reflected similar events but without the same consequences.

Families

In examining responses to the three parent interviews obtained when the child was four, five, and nine years of age, examples were provided for changes in family status, situations, and process variables. Changes in status and situational variables included those in family structure, employment status, welfare status, material well-being, home ownership, crowding, mobility and so forth. Attitudinal and behavioural changes were noted also, reflecting changes in feelings of alienation, powerlessness, and optimism, in child-rearing practices, and in participation in school-related activities. Again, there was no one area of change that was unique for families of "exceptional" study children.

Teachers

Similarly, examination of programmatic information gathered regarding the schools and classrooms the children attended yielded no striking contrast at any one grade level. But, when examining the data sequentially, a pattern did emerge for children in the exceptional positive deviation category: a cognitively stimulating atmosphere, where the teacher was rated at least moderately warm, had been present for at least several years. For example, what may have started as small increases in the child's knowledge of school-relevant information, confidence, task orientation, and achievement motivation in a Head Start preschool program was apparently reinforced and enhanced by teachers in kindergarten and later primary grades.

Most of these children (in contrast to many others in the study sample) never had teachers who were described as unenthusiastic, unprepared, using primarily negative reinforcement techniques, or providing little cognitive stimulation. Instead, such teachers were supportive, were warm, and were above average in our observation schedules in their use of positive reinforcement techniques. They made frequent and varied use of both verbal and non-verbal techniques for praising, and instead of criticising a child when s/he could not execute a particular instruction, the teacher altered to adapted his or her behaviour to that child. Here I am not referring to particular instructional styles or programs, or to variables such as open versus highly structured classrooms, since these were not discriminating variables affecting how well the child did. The important features were the teachers who were enthusiastic, who were informed about what they were doing, who enjoyed, who smiled a lot, who emphasized cognitive stimulation, encouraged the children to talk, to discuss, to link cause and effect. All these teachers also used entirely small group or one-to-one kinds of teaching methods, and were able to individualize and adapt their own behaviour to the needs of the child.

Home and Classroom Interaction

The most common picture that emerged for those children who showed the most gain in academic achievement was the previously mentioned continuing warm and stimulating classroom environment combined with a home environment that provided the child with emotional support in general and support for school activities in particular. Examples of parental school-supportive activities included visiting the school, participating in classroom activities, knowledge of the child's functioning in school, higher expectations for the child's educational attainment, and in some cases, the parents' involvement in their own continuing education.

It must be emphasized that for these "deviation" cases, the above examples of supportive activities emerged following the initial parent interview. In some cases they reflected changes in parental behaviour as a function of the preschool program the child attended. For example, in one family, the mother began by visiting her child's preschool program, later became a volunteer classroom aide, and by the time the child was in third grade had returned to school for a high-school equivalency certificate and was enrolled in a local community college. Both parent and child showed parallel educational growth. But it appeared obvious that the home did not have impact on the child's progress in a sole or independent fashion. The child's preschool and grade school experiences were directly facilitating in this particular family not only to the child but to the mother, and thereby also acted indirectly on the child. The mother obtained information and emotional support in the school setting. In response to greater acceptance she participated more; and from such participation there appeared to develop an increased sense of efficacy and optimism with greater awareness and use of community resources to meet family needs. In the positive deviation group it is therefore important to note that family involvement and interest is not simply a parent variable, but also a school variable. The more positive schools welcomed parents in conversations with teachers and in capacities such as volunteers and aides, and helped the parents become involved and knowing, and these factors contributed to the positive effects of feeling more powerful acting within the school setting, feeling more comfortable dealing with school personnel, and feeling less alienated from processes affecting their children.

Another example of parallel child and family growth is seen in the following case. Tommy (fictitious name), the youngest of fifteen children, was very nervous and shy during initial testing. Not used to being required to do things on his own, he refused several tasks and cried often. The next year he attended Head Start. According to his mother, Head Start "changed him in every way", but especially in helping him learn to play with other children and in becoming more independent. When seen again at the testing center he was no longer reserved and shy. In addition to these increased social skills, his test performance showed that he had gained much from the cognitive stimulation of the preschool program and also from his daily viewing of Sesame Street. Moreover, his parents continued to provide a very warm, affectionate home environment. Both parents were highly supportive of school activities; they read to their son often and had high educational aspirations for him. Despite the many children in the family, the mother's interview responses reflected a very differentiated and realistic appraisal of her child's strengths and weaknesses. In kindergarten he was described as having made very good classroom social and emotional adjustment and was a happy, independent, and able learner. His first grade classroom appeared generally unstimulating, but the children were attentive and studious and the teacher tried to individualize the curriculum in a generally open, permissive environment. In contrast to Head Start he reported liking school "only a little bit". His performance in school and on our test batteries, however, remained above average. His third grade class, organized for team teaching, was a particularly happy, orderly, and stimulating environment. The teachers were affectionate and spent much of their teaching time with individual children. Thus, home and school together provided a nurturing and supportive environment for the child's growth.

Interaction Failure

Just as the above case exemplifies the realization of the child's potential for growth when home and school work together to provide an emotionally supportive and cognitively stimulating environment, the next example indicates the tragedy that evolves when home and school not only fail to interact, but when there is a lack of communication and coordination among those adults representing various social agencies purporting to serve the child. When first seen at the testing center, John (fictitious name) was outgoing, friendly, and verbal, responding well to the variety of tasks in the four-day battery. He lived with his mother and two older sisters in a small crowded apartment with few conveniences or possessions of his own. During the mother-child interaction sessions, he showed considerable initiative in responding, and was highly task-oriented and attentive. His mother was affectionate and provided him with frequent positive feedback and praise. Although she was somewhat limited in her presenting of task-relevant information, the child learned tasks quickly and well. When seen the following year at age four-and-a-half, John continued to perform well on the many diverse tasks administered, and testers consistently described him as an attentive, friendly, verbal boy with whom they enjoyed working. He attended a Head Start program and was described by his teacher as socially mature, creative, and quick to learn. His kindergarten teacher gave a similar appraisal, although she noted he seemed somewhat bored. His individual testing that year continued to indicate above-average cognitive and social competencies. When interviewed in first grade, he expressed strong liking for school, especially reading. The teacher rated him as very task-oriented, friendly, and non-aggressive.

However, he changed from public to private school in first grade and when he transferred back to public school in second grade, he began to show increasing absenteeism, although his test performance continued to be adequate. That year his teacher rated him as only somewhat attentive in school. In third grade he continued to perform well on individual tests, but when interviewed again about school he expressed considerable dislike, especially for reading. His teacher described him as not at all attentive in his school work and not friendly with his classmates. On the group achievement tests he scored significantly below the mean performance level for other black Head Start eligible study children. During the home interview the mother repeatedly expressed concern about her son, and reported that within the past two years he complained increasingly of stomach-aches necessitating increasing absence from school. He finally had to be hospitalized and was tentatively diagnosed as having a stomach ulcer. The mother felt her son's problems were due to emotional upset over not having a father. Although badly wanting to help her son, she didn't know what to do. There was no indication of communication between home and school, no sharing of information, no provision of resources. Teachers at different grade levels apparently were not questioning the discrepancies in teacher ratings and attempting to understand and counteract their causes.

The teacher in the third grade "knew" that this child was uninterested, hostile and one who should be left back. She was not finding that previous teachers thought this child was an extremely able, extremely creative child, a delight to teach. Nor was the physician who treated this child consulting with teachers or obtaining counselling help for the child or his mother. Yet without such communication, such combining of knowledge and resources, how likely is this child, particularly one who is economically disadvantaged and of minority status, to reverse his downward achievement trend? Instead, a horrendous cycle of absenteeism, little if any academic progress, negative reinforcement, reduced academic motivation and interest, and increasing anxiety and negative self-evaluation has been set in motion. This case and the many others clearly indicate the need for working with the total ecology of the child if we truly care and wish to serve our children well.

Before concluding this sampling of case study findings it must be pointed out that there were cases where examination of the many accumulated bits of information provided no apparent clues as to causal factors for exceptional academic gain or loss. Some children appeared to have everything working against them, an exceedingly impoverished, continuing stressful, non-supportive home environment, and a sequence of unexceptional classroom settings, but they still evidence strong academic skills in third grade. Of course, the consequences of these negative factors may appear later. One such child has begun to express increasingly negative statements about himself and his family, negative feelings which if continued may increasingly interfere with other areas of functioning. However, it is also clear that despite the extensive and in-depth assessment provided in the present study, we have only begun to explore the surface of these crucial dynamic factors in the child and his or her environment which affect performance in the school setting.

SOME GENERALIZATIONS

Some significant generalizations emerged from the intensive longitudinal examination of these exceptional study children. Firstly, any particular aspect of individual functioning must be evaluated in the context of other aspects of the developing child and the environmental conditions in which the child is behaving. For example, development of affective and intellective behaviours were found to be closely intertwined. Thus, knowledge of behaviours in one domain added interpretation in the other whether for understanding responses to the testers or to teachers and peers in the classroom. Similarly, intellectual and motivational correlates of variation in the child's health and physical status were evidenced.

Secondly, the implications of many variables become understandable only after examining that variable and its interactions developmentally. This suggests a theoretical approach which considers developmental changes in both the child and the environments in which that development is embedded, and more extensive use of longitudinal designs. It also implies that providing "exceptional" children such as those in the present sample with appropriate learning environments requires an historical perspective which a cut-off score does not suggest.

Thirdly, not only do home and school variables, particularly parent-child and teacher-child interactions, influence the child's behaviour, but most such effects are reciprocal and not unidirectional, as the case history of "John" demonstrates. Fourth, interactions of individuals and the environments in which they function are dynamic. Predictability of a child's achievement from early indices of the home environment should not, therefore, be interpreted to mean that these predictors necessarily determine the child's achievement. Families, children, and schools can and do change, with corresponding changes in the nature of their interactions, and such change can be enriching or harmful. In contrast to some interpretations of early childhood research findings, such as found in White and Watts (1973), the age period three to six years is *not* just a period of refining established relations.

Fifth, in many cases, developmental progress was gradual across the time intervals in which measures were administered. In addition, growth in one domain often served as a precursor to growth in another. Thus, development in one area may proceed in seemingly irregular spurts and be inappropriately assessed by traditional linear analytic methods. We need to develop greater sensitivity to measurement and interpretation of such changes and their cumulative effects so that we can enhance positive growth and counteract possible negative influences. These considerations also suggest the importance of long-term evaluation of intervention efforts. It may take several years of small cumulative gains before such gains are large enough to be statistically significant, which may account in part for some of the "sleeper" effects recently reported for upper-elementary grade low socio-economic children who had experienced early intervention programs (Palmer, 1976; Seitz et al, 1976).

A sixth point, as a corollary, is that facilitating influences usually require continuing reinforcement to maintain their positive effects. For example, most youngsters in Head Start evidenced increases in pre-academic skills, task orientation, achievement motivation, and social skills in relating to their peers and to other adults. The academic gains generally were not maintained, however, when the grade-school program apparently did not capitalize on children's acquired skills and motivation. The finding by Coleman and his colleagues (1966) that disadvantaged children are more affected by the quality of teaching may be more crucial as children's sensitivity to their school experience is heightened by programs such as Head Start or daycare enrichment. For those children who showed the greatest gain in academic skills between ages four and nine, following Head Start attendance, there was a continuity of facilitating school experiences; at each primary-grade level these children had enthusiastic, warm, positively motivating, cognitively stimulating teachers who taught in a one-to-one or small-group setting. Such continuity in facilitating school experiences is practically non-existent for a sizable minority of low-income children who move frequently between schools, a situation common to many urban areas. Moreover, this continuing warm and stimulating school environment was combined with a home environment that provided the child with emotional support in general and support for school activities in particular.

And finally, in reviewing the information gathered, one becomes acutely aware of the multiplicity of positive and negative factors for those children in these extreme achievement categories. Thus, it is not a particular parent, teacher, or child attitude, attribute, or behaviour, or a particular social setting, but the cumulative effects of their multiple interactions. Moreover, for different children, different clusters of variables appear to be differentially effective, suggesting the need for multidimensional assessment of individuals and their environments.

STUDY IMPLICATIONS

As case histories in this study indicate, low socio-economic status and minority group membership do not necessarily imply low school achievement. The children showed a wide range of aptitudes and abilities. Moreover, parents and teachers do make a difference. Thus, findings of this study are supportive of the importance of early parent-child interactions as well as the child's early acquisition of school-relevant skills and motivation and those programs such as Head Start which emphasize the parents' involvement in the child's educational experience. In describing the interrelatedness of family status, situational, and process variables, the data also suggest the potential positive impact of economic aid to impoverished families in raising competence levels in the children.

Even small differences, for example, in material possessions and household density were associated with children's higher achievement and the necessity for coordination of services to support the child and his or her family. These findings and the several case histories described are consistent with those projects recently reviewed by Meier (1976) in suggesting that cognitive gains are likely to be largest and to be sustained when there is support in the total ecology of the child, not just in the quality of parent-child interactions, but also in adequate health care, nutrition, housing, and general family support. The findings also support Meier's proposal for Neighbourhood Family Development Centres to coordinate comprehensive service, training and research functions as a base for modifying the total ecology of the developing child.

The data also indicated the potency of classroom interactions on the child's progress. Similarly, Bloom (1976) in his recent book challenges the schools to provide all children with appropriate learning opportunities, and describes a mastery approach that has promising results with older students. The importance of the complementarity among socializing influences, however, was evident in the present sample. Parent-to-child or teacher-to-child models appear too simplistic for characterization of minority children's achievement behaviour. Sustained intellectual growth depends on the quality of relationships established between parent, teacher, and child. More research and development activities are needed which focus on elaborating the mechanisms by which home and school can work more effectively together to enhance the child's development.

CONCLUSION

The children in the present sample would be considered by most as "children at risk", but in following six years in their lives we see no inevitable sequence of events which could not have been otherwise determined. Those case studies which exemplified the nurturance and acceleration of competencies during the six year span of the study speak out against those who accept the inevitability of increasing despair and failure of low-income minority children in school. Our responsibility is to create situations where such children are typical, not exceptional. Each of these children had a family able to provide love, concern, and support for their school activities, teachers who provided them with the necessary encouragement, stimulation and reinforcement for learning in a manner responsive to their particular learning styles, and they were not beset by physical or other problems interfering with their ability to respond adequately and progress. We must coordinate our resources to assure no child receives less. It is hoped that this study provides some clues to the theoretical considerations and applied strategies that will contribute to an undertaking of the complexities of early identification and intervention.

FOOTNOTES

[1] Reported in "Maintaining and Enhancing Early Intervention Gains", by Virginia C. Shipman, Educational Testing Service, Princeton, New Jersey, an abridged version of Project 76-21, "Notable Early Characteristics of High and Low Achieving Black Low-SES Children", which was prepared for the Office of Child Development, Department of Health, Education and Welfare under Grant H-8256. See also Shipman (1971, 1972) and Shipman et al (1976).

[2] It should be noted that such an approach is not seen as an alternative or substitute for previous analyses, but rather as a supplement to them. However, close examination of the preschool and primary grade programmatic information gathered should help delineate critical factors in the child's early school experiences. Those factors or processes not identified previously in the larger sample can then serve as hypotheses to be tested in subsequent experimental studies.

[3] The Cooperative Primary Tests are a nationally standardized American achievement test battery developed by E.T.S. and designed for use in grades one through three. See Cooperative Test Division (1967) and Cooperative Tests and Service (1970).

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PRESCHOOL SCREENING: READY? SET? GO!

Judith S. Palfrey M.D.

INTRODUCTION

Preschool screening is clearly with us as a major educational/diagnostic innovation of the late seventies and early eighties. As one looks over the vast amount of literature that has grown up in the past ten years about developmental screening, it becomes quite clear that what was simply on the drawing boards a decade ago has become a massive reality today. The problem is that in its translation from idea to reality it has not yet achieved solid form, and many questions about its applicability, usefulness and hazards remain. As the province of Ontario approaches the implementation of preschool screening, it will be useful for the planners to proceed cautiously, to view sceptically the claims of instrument and curriculum developers, and to choose wisely the direction in which their preschool programs will go.

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SCREENING CRITERIA

In the following paper, I would like to use the eight criteria for preschool screening which were set out in 1974 by Frankenburg as follows:

1. A screening procedure should be screening for something which is important.
2. It should be screening for something which is prevalent.
3. There should be accepted criteria for diagnosis.
4. The condition for which screening is conducted should be treatable or controllable.
5. There should be some advantage to earlier treatment.
6. The duration of "screening time" should be reasonable.
7. There should be available diagnostic and treatment resources.
8. Program cost should be reasonable.

IMPORTANCE

As educators and child-helping professionals, we are all aware of the devastating effect of educational handicap. It is clear that children who fail in school suffer the downward spiral of failure, low self-esteem, depression, more failure, more low self-esteem, and chronic depression. We are also aware that handicapped children are viewed as different by teachers and other children, that they are often unconsciously ostracized, and that they suffer the double handicap of missing the social interactions which are so important for personal growth.

With regard to the first criterion of importance, there is no question that "educational failure" or "school problems" or "handicaps" are serious, but the question can be raised whether these elements constitute one problem. When screening programs are set up for medical conditions such as phenylketonuria, hypothyroidism or lead poisoning, the screeners know exactly what disorder they are looking for. There is one important problem being sought. With educational handicap or school failure, there are nearly as many definitions as there are people writing about the subject. This has been a major problem in the United States (1977) with Public Law 94-142, the Education for All Handicapped Children Act. When the law was first drafted, the definition of "handicapped children" covered primarily those who fit the so-called low-incidence, high-severity definition of educational problems but, as the regulations have been amended, the law has been liberalized to cover children with "learning disabilities". "Learning disabilities" is a term that has been almost impossible to define. Countless panels and international meetings have been convened for the purpose, but none has been totally successful.

What then are we screening for? What is *the* important problem? The heterogeneity of school problems makes it difficult for the first criterion to be fulfilled. Because of the indeterminate nature of the problem being screened for, there is danger of serious misunderstanding on the part of the professionals involved in screening, the teachers receiving the screened children, and the parents. For example, suppose a little boy "fails" a developmental screening test because he is extraordinarily clumsy and can't hold a pencil very well and besides has funny tongue movements when he is trying to write, but is a bright child with normal language and social milestones. It takes a tremendous amount of time and careful explanation to convey to his parents (and to school personnel) the nature of strengths and weaknesses, and to point out the fact that mild disability in one area of functioning does not necessarily connote overall handicap. It takes great sensitivity to allow that child a unique description, to have him pass into kindergarten or first grade identified, but not labelled; distinguished from the other children who have also "failed" the screening, rather than lumped with them at the bottom of the pack.

This process of identification is one that does not plague the biochemists who screen for specific medical conditions. Infants either have too much of a certain chemical in their blood or they don't. On the other hand, preschoolers screened by developmentalists can fail their screening because they are colour blind, because they can't follow instructions, because they can't do a tandem gait, because they are overactive, because they are underactive, because they can't get themselves dressed, because they can't separate from their parents, because they can't make eye contact . . . and on and on. We must acknowledge this in order to forewarn ourselves and teachers and parents, letting them know that yes, Johnny and Jill both had difficulties on their screening, but no, Johnny and Jill are in no way alike and they require different kinds of help.

PREVALENCE

The second criterion for screening is that the problem being screened for be prevalent. In some ways, the prevalence criterion is tied to cost-benefit issues and to ease of test administration. There is an uncanny way in which the numbers ten to fifteen percent appear whenever school dysfunction is discussed. For example, twelve percent is the number apparently being used by the Ontario Ministry of Education in terms of special education. Rutter et al (1970), in their study of children on the Isle of Wight, found that one in six had some sort of handicapping condition. The Bureau of Education for the Handicapped in the United States determined in 1975 (United States, 1977) that twelve percent of children had educational handicaps. One could argue that we are simply looking at the lower tail of the bell-shaped curve and that we are not, therefore, discussing the prevalence of a problem. Again this is a point where developmental issues deviate from biochemical or other highly quantifiable ones. Nonetheless, school dysfunction is a prevalent problem, far more prevalent than other disorders for which screening is already well justified.

DIAGNOSIS

With regard to Frankenburg's third criterion, professional diagnosticians, teachers and parents have no difficulty in recognizing and/or accepting the "diagnosis" at the extremes of developmental deviance. However, along the continuum when findings are more subtle, where "tincture of time" or minimal intervention may be extremely curative, developmental diagnosis can become tenuous. Furthermore, the state of the diagnostic art in school dysfunction is in its infancy. Observations of individual children often cannot be analyzed systematically because there is no clear-cut taxonomy for doing so. This should not discourage those who are involved in developmental diagnosis because it is a major challenge to them to formulate better diagnostic techniques and categories, but, by the same token, it does mean that it is difficult to screen when there are no clear-cut diagnostic categories that the screened children can fall into.

TREATABLE

I understand from my friends in education that there is more and more convincing data appearing that support the argument for early identification of handicap as the first best step to remediation. I have been personally dedicated to this idea, but have remained somewhat sceptical because of the lack of strong evaluative evidence that this is so. However, now that there have been model intervention programs in effect for five and sometimes more years, there are beginning to appear whispers of evidence that early intervention can work. With regard to Frankenburg's fourth criterion, it is therefore not unreasonable to presume that pre-kindergarten screening and early identification might also be helpful. A recent British study by Smith and Phillips (1978) looked at a group of severely retarded and handicapped children, and asked the very simple question, "When was this very manifest problem first identified and shared with the parents?" Twenty-five percent of these children were actually not identified before the age of four or five. Furthermore, the study found that early identification was useful for picking up those children with more subtle problems that had created parental concern, but for whom no diagnostic confirmations were previously offered or available.

What is somewhat discouraging is that there is not always an automatic hook-up between the screening and the educational programs. It is not very useful to screen in the beginning of kindergarten if there is no intention of doing anything about the problem until first or second grade. This has been the experience, admittedly limited, with a preschool screening program in Brookline. It may be that the screening is not totally accepted by the school people, and distrusting the results they feel they shouldn't involve the children in special programming. But it is discouraging to see the same children showing up at the end of kindergarten who are identified at school entry as having difficulty. There is a serious ethical issue in all this. It affects all aspects of early identification, but is of particular importance with regard to treatment. If there is treatment available, then screening is justified, but if curricular and special education teachers or specially trained classroom teachers are not available, then screening does nothing more than raise anxiety, and thus does considerably more harm than good.

EARLIER TREATMENT

There is an example of the fifth criterion, advantages of earlier treatment, in an advertisement currently running in the pediatric journals which shows a row of rosy cheeked, hardly dressed, adorable cartoon babies standing in a line. Above the babies is the heading "pre-allergic". The caption under the picture explains to the physician that there is a laboratory test available which will help him or her know if a patient has a chance of becoming allergic in the future. As cute as the babies are, and as dedicated as I am to the notion of screening, I can't quite bring myself to believe it would help in any way to have that information.

Not long ago, a number of developmentalists from our hospital were speaking about developmental screening with some other physicians involved in more traditional bio-medical research. Their response to us was, "Why do you care about a developmental or behavioural problem until it becomes manifest? Won't you be able to identify it and deal with it then?" Hearing this comment, my mind immediately flashed back to the ludicrous "pre-allergic" notion, and I wondered if developmental screening (including profiles of health and social parameters) was falling into the pitfall of overidentification and possibly wrong identification.

What is at stake is really two issues. Firstly, can screening bring out or provoke latent problems which parents and teachers have been unaware of or have not wanted to acknowledge, but are nonetheless significant and real problems? And, secondly, does the notion of "at risk" have any place in developmental preschool screening?

If screening can uncover existent problems before a child enters school (and if these problems are the same ones that are going to cause him or her difficulty later on) then it would seem that the criterion requiring that early treatment is beneficial would be fulfilled. The problem is, there are so many questions about intervention and about the natural history of these heterogeneous, ill-defined problems that it is hard to be clear about this. In fact, we don't know if earlier is better. We all believe that, but the evidence is not complete.

With regard to "at risk" status, many share a serious worry that labelling a child as "pre-problem" or "pre-hyperactive" or "pre-delinquent" may do a serious disservice to the child and his or her family. Defining "what is" may be helpful to a child and his or her teacher, but prophesying what might be may put a child at a disadvantage and leave the teacher in the awkward position of looking out for problems that may never become manifest. Additionally, the evidence that Dr. Shipman presented regarding the variability over time of children's performance makes it important that we evaluate periodically, rather than depend on a one-time assessment. Meisels (1978), who has been doing some studies of screening, has also suggested that screening take place over a number of points throughout the kindergarten year, so that a first group of children is identified and placed, and then a second screening takes place later in the year to ensure all children requiring special supports are receiving them, to ensure that such supports are not being offered unnecessarily, and so forth.

SCREENING TIME

Frankenburg, in the sixth criterion for effective preschool screening, talks about the important technical notion that there can be a period of time during which the given problem is not overt, but can still be detected. Parents and nursery teachers do not always see children as they will be seen in kindergarten, and therefore it is possible for a child to have a disability which has gone undetected but is nonetheless a serious threat to the child. Intermittent mild-to-moderate hearing loss is a good example of such a situation. A little girl with transient hearing loss due to colds and ear infections may not show clear symptoms of deafness, but may be a little cranky and irritable. Her language development may be adequate but not optimal or up to potential. It may not be until an audiogram is performed at her screening that the problem is actually articulated, whereas left unnoticed, she might arrive at second or third grade with depressed language skills. The screening time then is the period *prior* to the actual development of the full problem.

RESOURCES

The seventh criterion, that of availability of diagnostic and treatment resources, is of critical importance. Screening can be done in a matter of days by a travelling circus of professionals, or by professionals within the school. Recommendations can be easily generated. However, the success of a screening process depends entirely on the existence of diagnostic and treatment resources. This should be the question addressed before screening is ever put into place. Virginia Shipman pointed to the fact that in the United States, available resources seem to dictate the screening and determine what the diagnosis is likely to be. I agree that this is problematic. We shouldn't have only speech and language problems in schools where there are speech and language supports available, only psychological problems where there are psychiatrists available, and so forth.

It is essential for planners to think ahead to what the resource needs will be, and to have those available so that there is a systematic program worked out for diagnosis and treatment before the first screening test is done. If a child is identified as having a mild to moderate hearing loss, if a child is identified as having an articulation deficit, if a child is identified who appears autistic, what is to be done with or for those children? Certainly the province of Ontario will need to determine these issues before screening the first child.

COST

The eighth criterion, that of cost, is a very difficult one to address. Presumably the province of Ontario has thought about cost and decided that the benefits of screening programs are worth the cost, which in fact have often been analyzed on cost/benefit rates. The typical example is phenylketonuria, where it can be shown that the money spent by a community for the screening is much less than the money that would be spent in having to institutionalize a mentally retarded child. It is harder to calculate the benefits of preschool screening, and it has even been argued that it will cost school systems more money because identified children require services. Although it is not yet known, the hope is, of course, that the children who require services early on will not need them later. But we should be aware, as Dr. Shipman has pointed out, that a child who needs services in pre-kindergarten may need them in kindergarten, may need them again in first grade, and so forth. It may be that the type of service needed becomes less expensive or less elaborate as time goes on, but the fact that a child is doing better in relative terms doesn't necessarily mean that the supports can be pulled away.

VALIDITY

In addition to the eight criteria already discussed, a word should be said about screening instruments and the whole process of developmental screening. Screening and early identification are good ideas. They have grown out of an important civil rights movement for the betterment of handicapped individuals. I don't know how fully the movement has developed in Canada, but we are acutely aware of it in the United States. One of the most exciting things that has happened in the 1970's is that handicapped individuals are finally being given their due rights in society. What is a little frightening, however, is that mandates such as the one Ontario is now under, as well as the American Public Law 94-142, assume a sophistication of diagnostic design which simply does not exist.

If one goes through the screening literature, it becomes clear that about ten years ago, many centres and individuals recognized the trend toward early identification of handicap and equally realized that there were no tests which could be used for large-scale screening. And, as Dr. Shipman has pointed out, the result was that many groups began independently to produce such instruments. The work which has come out is encouraging, but there are still serious shortcomings associated with most of the instruments. There have been a number of review articles about screening tools. Meier (1976), Thorpe (1974), Meisels (1978) and others have pointed to the fact that the screening instruments available have been standardized on small samples, from narrow sociodemographic and geographic areas, and that there is danger in generalizing from any of them. The tool which screens children in Trenton, New Jersey may not adequately screen children in Toronto, Ontario. A standardizing population selected in Denver may not adequately reflect norms useful for lower socio-economic children elsewhere.

In addition, there are concerns about the predictive validity of the screening instruments since this has not been well documented for most of the instruments. The authors of the Denver Developmental Instrument (Van Doorninck et al, 1976; Camp et al, 1977), for example, are now concerned at the lack of predictive validity evidenced with older preschool children, although the procedure is still considered useful for infants. Even those such as Frankenburg, who have made major contributions to the field, have very serious concerns indeed about the effectiveness of screening tools.

OVERIDENTIFICATION

As screening becomes a part of the lives in our communities, some of the hazards need to be recognized. The largest of these, I think, is overidentification. Screening tools in the hands of partially or newly trained professionals or paraprofessionals may yield almost meaningless results. Screening of children aged three to five, for example, has recently been mandated in Massachusetts. One town that I am familiar with instituted a formal screening for three-year-olds (absolutely the most difficult age to test). They identified problems in forty percent of the children and were then embarrassed that they were unable to determine which children really needed referral and services, and which children fit within the normative range. The experience at the Brookline Early Education Project (BEEP) would confirm the high rate of findings at this age, but it is crucial that findings not be considered equivalent to screening failure. When this kind of mandated screening for three to five year olds is available, is it necessary to say that forty percent of the children have problems, or can criteria be developed to decide how many findings to examine, what kinds of findings, and what the determinants of screening ought to be? In Massachusetts, it is interesting to note that each town is developing its own program. Some are just putting up a phone number, and if parents think their child has a problem, they can call; others are using very simple census procedures. The worry is that as different kinds of personnel are used, the greater the variation in the recognition of problems. We must realize we may be overidentifying children, and we must realize the limitations of the screeners.

There is another related hazard of screening and identification, and that is that we may be overstating the problem. There is a popular book in the United States called *The Myth of the Hyperactive Child*. The authors (Schrag & Divoky, 1976) make the compelling statement that "a well-intentioned movement to provide adequate schooling for truly handicapped youngsters has turned into a comprehensive screening and sorting game in which new categories of problems and new labels are continually being created, and in which children are being found to fit them".

The foregoing is an extreme view, but a perspective worth consideration, and leading to the legitimate questions: Is it a problem and is it a prevalent one? Which children do we really want to identify? Who can we help and how can we help them? Educators are in a position now in Ontario where programs are being initiated with some dedication to competent execution. But it is very important to keep in mind that we don't take our own biases, our own standards of what is "normal", and impose them on others. We must ensure that there is room for individual variation, and for developmental variation, and that we view each child from a very wide perspective indeed.

COMMUNITY EFFECTS

Finally, not long ago my own five-year-old had his preschool screening and I gained from the experience that perspective one can only learn by being a parent. We had not said much to Quentin about the screening other than to say he was going to play some games at his new school, but somehow, through the nursery school underground, he learned all sorts of things about the testing. The night before his appointment he couldn't sleep. He called me into his room to tell me that "Tara couldn't do the diamond". He asked to "practice" the vision and hearing. The day of the test, he rushed me through lunch and said, "If we are late getting there it will be your fault." His anxiety was so painfully obvious as he thought through which transition object to bring with him--his baseball hat, his Paddington Bear, or his birthday balloon--and finally rejected them all realizing that he was too big for all that. Several of his friends' mothers reported the same sort of behaviour, the same high anxiety level.

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I recount this anecdote only to indicate that at least in one community, screening takes on such major importance that even the children feel it. Certainly the anxiety is minimal compared to the benefits we hope will accrue from the screening process, but it is well to remember it as we evaluate what goes on in communities. We need to be very clear about what we want to accomplish with screening. It is not to introduce our young children to notions of success and failure, as they have time enough for that. Certainly it is not to create problems where they don't exist by defining normality as abnormality. Clearly we do not want to overemphasize one aspect of learning to the detriment of others.

We are at a strange crossroads as we move from the seventies into the eighties. The problems have been defined and the solutions are at hand, but the mechanisms are still untried. Ontario faces a major challenge as screening programs are instituted. Perspective and balance will be necessary in the successful management of these programs. It is hoped that such screening will be of benefit to the children of the province of Ontario.

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PROBLEM AND PROMISE IN EARLY IDENTIFICATION: CHILDREN WITH SPECIAL NEEDS

Dr. Griffith Morgan

INTRODUCTION

Dr. Shipman, in her paper "Perspectives in Early Identification and Intervention", has demonstrated the subtlety and complexity of the factors which affect the progress or deterioration of Head Start children in the preschool to primary years. These factors involve interactions among the child's growth, the school and the family over prolonged periods of time; there can be no simple causal or linear relationship between specific factors and the child's progress.

Prediction of school success or failure in the usual sense is unrewarding and probably impracticable. This raises questions about the efficacy of "identification" of early learning failures or failure to adapt to school. The emphasis must be on describing in detail, analayzing and explaining the child's development within his or her environment, and points to the need to make environmental changes work for progress if possible. This does not make "intervention" any easier; rather, it makes planning of developmental or remedial programs even more difficult, needing to take into account the teacher and educational environment, the home and community, as well as the child's own cognitive and social development.

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Emphasis has been placed on dealing with the whole child in his or her environment, and on dealing with all children in the age group which is "identified". The "deficit" model has been decried in this conference. Presumably, this means avoiding looking for, defining and treating specific or general handicaps or learning failures as such. In agreement with Dr. Shipman, I find the word "deficit" in this context emotive and rather useless. I also sympathize fully with the need to address our attention to the whole child-environment interaction and to meet the needs of all children by suitable response and modification of school programs. However, it should be pointed out that Dr. Shipman's results refer to a long-range study with considerable resources; it is not the average situation in which a large number of children have to be examined.

I believe that early identification (of cognitive and social difficulties and our response to these findings) must at this stage pinpoint the child with "special needs" so that we can speedily intervene to begin the process of more effective developmental learning or more or less specific remediation.

SPECIAL NEEDS

The words "special needs" are taken from the Warnock Report (1978), the most recent British commission on handicap in young children and young people. It is intended to avoid the implications of "handicap" or "exceptionality" and to direct attention to the specific, individual and special needs of a large minority of children, including those usually defined as handicapped. As many as sixteen percent of the school population are in special need at one time or another during their school life, according to Warnock. Indeed, the concept that early "identification" should deal with all children and be rooted firmly in developmental perspectives (and the best preschool to primary education) is, in part, an extension of the concept of "special need", and of the individualizing of our assessments and intervention.

At this early stage in Ontario, the danger is in defining the goals so broadly, and spreading resources so widely, that little which is effective will be done. The child with identified special needs requires detailed assessment, urgent attention and improved teaching, but time and resources are limited. Much of our current discussion of early identification is really a discussion of screening of children's development and performance. For example, the Windsor Early Identification Project (Ontario Ministry of Education, 1978) (described in section 2 of this volume) is really only a screening procedure. It does not deal with programming, nor does it include the later stages of identification of special or general needs.

MULTI-STAGE SCREENING

A screening procedure is the first and most basic step to full review of children's needs. It usually depends on limited examination of the child's performance and development, and a limited sampling of the important factors in the environment such as health history, risk factors in the child's social and personal history, and so forth. It must take limited time and resources, since it normally covers the whole population including those at risk. It must be simple, economical, practical--and fast--if it is to be used effectively. As an example, the Ontario Ministry of Education's 1978 circular on this topic refers only to the need to screen language and math performance and possibly other abilities and background.

Screening must be regarded as only the first stage to be followed by more detailed investigations of some or all children, possibly coupled with change of program or placement and/or experimental manipulations of the environment. This is why I would endorse the multi-stage approach to early identification which some American sources (for example, Meier, 1976) label the "cascade" model. The "cascade" refers to preliminary screening, followed by more detailed examination, at successive stages, of smaller and smaller numbers of children with increasingly specific or severe problems.

An obvious crude model of screening is the ascertainment of hearing handicap in the young child. It is crucial, in view of the effect of hearing handicap on language development, and in turn, on the total verbal and educational history of the child, that this handicap be detected as early as possible--in the first months or year of life if possible, and certainly as early as possible during the crucial period for language acquistion from one year of age on.

Recently I assessed a girl of five years of age in a developmental centre. She had only one spontaneous utterance--"Mom-my"--although on occasion she produced reasonable imitations of familiar words. Her test performance (but more crucially her level of symbolic play with a doll and play objects) indicated that she was functioning at a two year age level. However, the complete lack of language and extremely poor auditory memory were a puzzle, until the interviewer came up behind the girl when she was preoccupied with eating her mid-morning snack, in a circle of low-functioning children who were quite aware of what the interviewer was doing. Neither the clashing of cymbals, beating of a drum nor ringing of bells produced any response in this little girl. She probably had undetected hearing loss and, if so, must have had this for a long time. How did this tragic oversight occur? It resulted from the lack of consistent and effective screening for hearing handicap.

And yet, over twenty years ago, in North Wales--a remote, poor and underpopulated area--the public health nurses had been trained by Sir Alexander Ewing to screen for obvious hearing handicap. This was done by having the child's attention engaged by a first person, while the second would ring a small bell, crumple paper, blow a whistle or shake a rattle; a crude way of detecting hearing loss, in a more or less noisy natural environment, but efficient enough in picking up children who had significant hearing loss so that they could be referred to urban centres and specialized services for detailed audiometric diagnosis and skilled help. The use of a hearing aid, advice to parents by the public health service, help for the parents by itinerant advisory teachers, and the ultimate placement of the child in the most appropriate school environment (regular or special) could follow. The child could be kept under review as needed. It should also be noted that this level of screening could take place only when the public health service had a high degree of autonomy to interact with parents, schools and other services, at a time when the public health nurses were also trained midwives with considerable experience in obstetrics and perinatal care. There was also direct contact with parents during statutory visits to families with new infants, and during "well baby" and toddler clinics. Unfortunately, the present system of medical care in Ontario has so "integrated" the public health nurse with the general practitioner service and so removed these social contacts, that early identification of this kind is heavily handicapped.

Another example of screening is the Santa Barbara Autism Dissemination Project (Donnellan-Walsh, 1976), unfortunately now defunct through lack of funds, which operated on a basis of early identification, direct and effective contact with teachers to provide both practical and theoretical training, and a "dissemination" approach to parents in which project staff provided them with both specific and practical techniques as well as support in managing their child's development, and personal guidance regarding their anxieties and problems.

This, however, is only the first and rudimentary stage. There must be a follow-through: the "cascade". Following initial survey and screening, there should be more detailed examination of some selected children who appear to have special needs, or more attention to all children to obtain more comprehensive answers about their development, learning and environment.

A classical survey was carried out under the auspices of Rocky Mountain Educational Laboratory, eventually involving eight American states (Meier, 1976). Children in eighty second grade classes (a random sample of the school systems) were identified, and 2,400 in all were investigated by their class teachers. The teachers used a standardized checklist of developmental behaviours and performance in school (developed by Meier, 1971) which has been shown in previous trials to select children with learning difficulties. They also applied a very limited array of spelling and reading tests of a brief survey variety.

From this preliminary screening, some fifteen percent of children were selected as having or likely to have significant developmental, learning or adjustment difficulties. At stage two, a more elaborate set of tests was then applied covering such factors as school attainment, vocabulary and language, visual and auditory perceptual processing, as well as brief testing of visual and auditory acuity. Finally, at stage three, some five percent of children judged to have significant learning problems were selected to be referred for diagnosis and recommendations for appropriate treatment to a number of specialists: psychologists, speech pathologists, neurologists, paediatricians, psychiatrists and so forth.

APPROACHES TO ASSESSMENT

This approach is not necessarily to be copied, but it does exemplify a number of important points. Firstly, screening cannot be equated with diagnosis or used as the basis of prescription of program. The measures used are too brief, unreliable and general to permit classification and identification of individuals as contrasted with groups. Adequate assessment can only occur when there is adequate information, usually at a later stage and a later time, following detailed testing, observation and possible trial teaching.

Secondly, the children in the Rocky Mountain survey are classified and looked at in broad bands of performance, and the broad bands are then re-examined. This also takes into consideration problems relating to the validity and reliability (a matter dealt with in more detail in section 2 of this volume, in the paper entitled "Problems of Prediction in Early Identification").

A third important point incorporated in the study is that the assessment is spaced out over time. This is necessary not only to accommodate detailed review of children at successive stages, but also to allow for the observation and teaching of children. Thus, the assessment is continued within the child's natural environment, and there is opportunity to respond to observed changes in the child.

Fourthly, the assessment moves from general and brief to increasingly specific and detailed investigation, aimed at detecting specific problems, specific or special needs, and particular patterns of development and environment for each child. I would also argue that "testing" must increasingly move from group tests or brief individual tests (the only ones which are practical for teachers to apply, in view of time constraints and the numbers of children served) to individual assessment and observation.

Furthermore, the focus must shift from a level where facts are gathered on the child's products (that is, his or her performance on standard tasks of language, visual and auditory processing, etc. which are pass/fail and graded) to increasing focus on both criterion testing and process variables. Criterion testing refers to what a child can and cannot do, regardless of where this places him or her in terms of other children. It gives direct guidance to the teacher or other professionals in knowing exactly where to intervene or where to get started on specific kinds of play, task experience or direct teaching. Process refers to interactive testing and observing in which *how* the child performs is more important than what his or her answer is; there is no incorrect answer or failure, since the interviewer corrects, cues and in effect teaches the child to see what his or her optimal level of learning might be. At present, this is exemplified fully only in Feuerstein's (1972) "Learning Potential Assessment Device" (or rather, in Feuerstein's flexible and clinical approach to learning and educational problems). Unfortunately, many of our school psychologists are as yet far removed, both by their training and in their daily practice, for this kind of flexible, systematic and powerful form of investigation of individual functioning.

TEACHERS' CHECKLISTS

It was noted that a teacher's checklist or inventory was incorporated in the first stage of Meier's (1976) identification procedure. One would recommend use of checklists or inventories by teachers to assist them in more systematic and perceptive observation and description of children, but not as a magic wand to identification. A number of checklists might be used, for example, the developmental checklists for preschool and early school-age children such as devised and improved by Amdur et al (1979); checklists such as Meier's (1971) which are slanted to pick up learning difficulties; or the checklists for disturbed behaviours used in the Isle of Wight Study (Rutter et al, 1970; see also references in Meier, 1976).

From the early reports of the National Foundation for Educational Research (England and Wales) in its studies (Watts et al, 1951) of selection of students for secondary schools in the 1950's, to a preschool identification study in California reported to the 1975 Biennial Conference for the Society for Study of Child Development in Denver, teachers' estimates or ranking of children's performances have been shown to be an effective means of describing children and predicting school adjustment and progress. They are as good as tests or better because of the extra information they contain on the child's performance--what Vernon called many years ago the "x" factor in adjustment and attainment (described in more detail in section 2, "Problems of Prediction in Early Identification").

TIMING OF IDENTIFICATION

As previously touched upon, an important principle, also emphasized in Dr. Shipman's studies, is the need to study the child over a period of time. It is hard to see how the teacher can observe and rate a child, or modify teaching and see what result this has, unless the child can be seen over time. This is a grave danger of an identification approach which closes the school in order to test and observe the child in the first two or three weeks of school.

Ideally, observation needs to take place over the whole kindergarten year, which should be viewed as a diagnostic teaching process. It would be better still spread over the kindergarten and grade one years. The need for time is one reason why one would advocate that screening take place at the junior kindergarten level or even earlier. Guided and instructed, observation and trial teaching by teachers can be the most effective assessment measure, far excelling tests. Ideally, there should be a teaching-testing-teaching sequence, like the classical T.O.T.E. (Test-Operate-Test-Exit) cycle in human learning described by the cognitive psychologists Miller, Galanter and Pribam (1960).

Experience from another culture and another time is instructive. In the United Kingdom, in the mid-sixties, there developed a number of responses to special education and the problem of assessing multiply handicapped and severely retarded children. It had already become standard practice to assimilate handicapped children (for example, those with visual and hearing handicaps) as individuals into regular nursery classes, or to develop special nursery and early primary units which were housed in regular schools and closely integrated with them for many activities. There also developed a variety of "diagnostic units". One kind was a class in the primary/junior school, often in decaying social areas where the school was old but solid and space was available near the children who were most likely to have intellectual and social problems. Children were taken in as young as four years or earlier, up to about seven years of age. The class size was six to eight children in number, with a teacher and a teacher's aide or volunteer.

Originally, the concept was to hold children for a specified time and thoroughly assess them for a wide range of risk factors before they passed on to regular school entry or to special provision. Some units were established with considerable promise of support by teams of psychologists, medical officers of health, paediatricians and other special services. The services did not come through, except for those lucky units with the dedicated personal interest of a local educational psychologist or medical officer.

Teachers, too, were intended to observe, use checklists, record, and assess as well as to teach. Training for observation was limited. Perforce, the teachers taught, adapted programs and techniques and incidentally observed and (where successful) closely recorded change and progress. They became clinical teachers. The children often improved and, paradoxically, were better assessed in terms of their real potential and progress than they would have been by static tests and uninvolved observation. The teachers brought about change, observed it and worked on it, in the ways described by Dr. Shipman in her paper.

PSEUDO-PROBLEMS

Another example is the special units for "ineducable" children (the "trainable retarded", to use the North American terminology) operating in Great Britain from 1960 to 1971. In looking at another culture, one can always marvel at why it chooses to confront--or in effect construct--its problems. The "ineducable" were the mentally retarded group excluded from the educational system by reason of low I.Q. and poor educational potential. They were at that time looked after in special units by the health authorities. The diagnostic units were attempts by the educational system to take these children into an "assessment" setting, to test and observe them over a finite period of time, and only then make the irretrievable decision. As Wittgenstein (1926) says, "the solution of the riddle of the universe consists in the vanishing of the riddle". The riddle eventually vanished in 1971, by virtue of one paragraph of a new education act, whereby all children were deemed to be educable and all became students.

In the strange episode of the "diagnostic units", these children were brought in for a period of three to six months; they might often remain for a year or two years. The decision for placement was constantly being delayed, the assessment never completed. Emphasis was placed on testing and observation (some of it intensive and skilled). Actual practice dictated that children should have programs of play and experience, and be taught, as well as receiving trial therapies as needed.

The result was that assessment units changed subtly into teaching units. Even when children passed "up" from such units to schools for

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the "educable mentally retarded", they were often placed, initially, in diagnostic classes. But, in turn, these classes became simply an extension of the main school and the children were absorbed. Many of the "ineducable" thus became the "educable". The problem of decision between the two categories was exposed as the statistical trap and educational sham that it was. A survey of these units carried out by Brennan and Herbert (1966) indicated a number of unsatisfactory features. A survey I carried out with colleagues (as members of Her Majesty's Inspectorate of Schools; Morgan et al, in 1967) also showed that "diagnostic units" in schools were often not assessment units but, in effect, special preschool units with adaptive teaching.

The lesson drawn is two-fold. First, we must be careful in defining our problem, or pseudo-problem, to avoid the dilemma of having to "identify" or categorize or assess, on a once-and-for-all basis, children who cannot be so categorized, or who change as we teach them, or as the environment changes. Second, the most effective form of assessment may be on-going clinical teaching coupled with careful observation and recording.

ASSESSMENT AND PROGRAMMING

A question asked during a previous discussion period was whether the assessment should be adapted to the kindergarten program or the kindergarten program adapted to the assessment. Paradoxically, and unexpectedly for those who know my views on the need for open, flexible and active early education, I would say that *the assessment should determine the program*. That is, it should direct and inform the program and forms of teaching for all children, if possible, but certainly for the sixteen percent in special need. If the assessment "determines the program", then at least there will be chance of improving the kindergarten program in all schools where it has not changed or been challenged for years (the majority), and will act as a stimulus for intensive developmental and "clinical" teaching in the first years of the child's school life.

In my view, the present kindergarten is incapable of meeting the demands placed upon it because it is only a part-time--and a very short part-time--unit in which forty children or more are taught in two batches, by teachers who have very limited status and power to modify the system or create a status for their stage of participation in children's education. Those in the present conference who have listened to the British contribution will realize that it makes use of the resources of the "infant school", a stage in which children attend full time between five and seven-and-a-half years of age, possibly preceded and supported by a nursery stage. In my view, we must have a full time powerful "kindergarten" stage which lasts at least two years and has its own resources and its own status, if there is to be fundamental progress rather than the modifications represented by the present "early identification" proposals.

There may be some partial alternatives. The city of Hamilton (included in our entrant study, Morgan et al, 1979) has junior kindergarten classes especially for inner-city children. Effectiveness would, of course, depend on program and teachers. I have not seen evaluations of the success of these partial "Head Start" programs. Dr. Shipman's findings (like those of the main Head Start program in the United States from 1965) would, however, suggest that this one year, half-time intervention is unlikely to make considerable or lasting impact, whereas the Province of Alberta's (1973) design for developing education for preschool children with special needs might provide alternative data.

There may be advantages in establishing special kindergarten classes, or pre-kindergarten/diagnostic kindergarten classes, for children identified as having special needs. This would avoid putting them into regular programs for which a proportion of children are not prepared, and would at least allow the preparation to begin. However, staffing, programs and resources of these special kindergarten programs must also be powerful. There must be access to a range of professional services--psychological, psychiatric, speech pathology, medical of various kinds--if full assessment in the second, third and succeeding stages is to occur, and if programs and treatments are to be fully adapted to children's needs. Heavy social support of disadvantaged, incompetent and "at risk" families is also needed at this stage or preferably, at the preschool stage.

Another question is whether screening and identification should take place in the first weeks of kindergarten at all. Rather, it should take place at the junior kindergarten level and be staged through that year and the next, if possible, especially since it is certainly more difficult to make lasting decisions about younger children. Our own study of school entrants (Morgan et al, 1979) in Ontario confirms the more unstable relationships of assessments and tests administered at the junior kindergarten level. Moreover, we must avoid the difficulty of using tests of perceptual and motor function simply because they seem most appropriate and easiest to administer at the preschool level. We must therefore find the assessment of attention, persistence, concepts and language which have much more important long-term descriptive and predictive value.

EARLY LANGUAGE INTERVENTION

All the evidence we have--from Buhler (1935) in Vienna in the 1920's to McVicker Hunt (1961) in the 1960's and Burton White (White & Watts, 1973) in the 1970's--repeats the importance of intervening as early as possible in the child's development if we wish to lay good cognitive and personal/social foundations for competence and mental health, trust, flexibility and creativity. Preferably then, some forms of identification (if not all) should take place at three years of age or even earlier. Certainly, in the field of language delay and handicap we should be identifying and helping children by age three when, in fact, language handicap already has demonstrated its existence and the need for remediation is already strong.

A recent major study of communication disorders in children (Morgan, 1978) carried out for the Ontario Ministry of Education shows that identification of children with communication disorder usually takes place at around age six, after about a year in the school system, and much more rarely at five or four years of age. Yet in some American states (for example, at Illinois' Northwestern University), children are being identified and given specialized help in language at age three or younger (see discussion in Morgan, 1978).

In the above 1978 report and the accompanying "advisement", a plea was made to the Minister of Education for earlier identification and remedial/developmental programs for language-handicapped children; a rationale was set out for assessment, as well as a review of what was implied in programs for such children. The assessment of language is likely to be an important aspect of all early identification procedures. But to move towards even earlier identification and intervention, even for specialized groups such as the language-impaired, will require fundamental changes in the functioning of the ministries and local services serving health and social/community services.

CO-ORDINATION OF SERVICES

Even to provide the necessary "stage two" and "stage three" of an adequate multi-stage or "cascade" approach to identification will need considerably more integration and coordination of services outside the strictly educational services than now occur. Resources must be available for follow-up and back-up of what teachers may find in their early screening. Appropriate programs are, as Dr. Shipman's study shows, medical, environmental and social, not just programs in school.

At the moment, a small minority of kindergarten children (around twenty percent) are reported by kindergarten teachers as having had a screening examination including developmental assessment before they reach school (see Morgan et al, 1979). To be precise, a small number of children have received the Denver Developmental Instrument at the hands of public health personnel who, experience would suggest, vary greatly in their competence and experience in applying a test such as the Denver, which requires considerable developmental and clinical knowledge for most effective use.

Reference was made, during the course of the conference, to inter-ministry discussion. One must be skeptical, in the light of past experience, of lasting effectiveness from these discussions. Even if they are fruitful, it is open to question whether the province of Ontario currently has the diagnostic resources to back up a front-line screening with more specialized assessments and treatments or guidance services. It is doubtful if board of education psychological services in many areas (even when they are fully staffed and available) can provide the services needed, unless their goals and training are fundamentally altered. More questions hang over the adequacy of provision for assessment and treatment provided by the speech/langauge pathology services, and over specialized services on the medical and neurological front. Further, the problems of sparesly populated areas, not just northern Ontario, are quite specific and not soluble by a classical multi-stage model. The services are not there, or not geared to the kind of massive community/preventive involvement required.

One of the implications of Dr. Shipman's presentation was the value of having different sources of information about the child. We need, therefore, to seek varied sources of information, not simply accept one set of tests or observations based on one environment. It is important to accept that these various pieces or sources of information have their own validity. In addition to Dr. Shipman's evidence supporting the need for complementary sources of assessment information, other studies (e.g., Rutter et al, 1970; Morgan et al, 1979, summarized in my later paper in this volume), delineate varying contributions provided by home and school. These perspectives that traditionally might have been interpreted as contradictory and therefore invalid are, in fact, most usefully regarded as providing multi-dimensional descriptions of the child in varying environments, thus enriching our understanding of the individual child.

PREDICTION

Another implication of Dr. Shipman's paper is that prediction of the classical kind, using tests or assessments to predict the extent to which later success or failure can be expected from an earlier test, is not very effective, certainly not over the long term of a year or more. However, studies have been done, reviewed in my next paper, which demonstrate that school success can be predicted within limits. But a high degree of precision in real long-term prediction seems most unlikely, in view of the severe limits imposed by our tests, in terms of their reliability and validity. In general, such batteries are effective for predicting and classifying group membership (that is, likelihood of having learning disabilities or special needs) but not individual description and prescription of program.

Another interesting issue, to be taken up in my later paper in this volume, is the test distributions to be expected in a screening/identification procedure, and the implications for the kinds of discrimination among individuals and classification of different groupings which are intended or emerge accidentally. One returns again to Dr. Shipman's findings, that children's development and progress in school are based on multiple, complex factors. Any single factor has a limited effect. She points out that "status" variables, such as sex, ethnicity, and socio-economic status, important as they may appear in research based on short-term comparisons, are really unlikely to have large, persistent or consistent effects simply in themselves.

It is interesting that, in a study of early entrants to school in Ontario (Morgan et al, 1979), the effects of parental socio-economic status and/or educational level have a limited relationship to the child's performance on tests at junior kindergarten level; the effect was much more marked, and significant statistically, at kindergarten level. It brought in both parents' socio-economic status; the best single grouping for prediction of the child's test performance was the joint effect of father's socio-economic status and mother's educational level. However, in absolute terms, the best correlation coefficient was low; it was much lower than prediction of the child's test performance from the teachers' rating of selected temperament scales, or ratings of language level/performance.

Dr. Shipman states that "process" variables--actual progress and change in performance, in the child's cognitive levels and kinds of functioning, in the environment and in teaching--are much more likely to be related to the child's way of coping and learning. She emphasizes that there is no good linear relationship of the classical statistical kind between outside variables and the child's progress, or even between variables "within" the child, as it were, and predicted progress in the same area. Growth or progress typically takes place slowly but with possible spurts from time to time. Not only are there preparatory periods in which the child's performance in one area prepares for growth in the same area; it can often happen that change in one area (motivation or health) can be shown, by tracing forward or back, to prepare conditions for progress in quite a different area (language or math, for example). Changes in the child (health, motivation, cognitive abilities, strategies) interact with the school environment, the teacher's personality and ways of individualizing learning for the child, and these in turn reciprocally interact with the family and surrounding environment. The effects are also multidimensional, not simply one way.

GENERAL SYSTEMS THEORY

The only theoretical framework which can accommodate these obvious facts and principles, it seems to me, is the general systems theory (Buckley, 1968). Many implications can be derived directly from this theory. One is that a system, whatever it is--a machine, a factory, a child, school, family, social system--has similar properties; it must adapt and change to survive and respond to the changes of the environment, if it is an "open" system; it coordinates simpler elements and processes into more complex integrations and sub-systems but, equally, differentiates general and unitary processes into sub-systems which interrelate and carry out specific functions.

In such a system, each element influences all others and finally itself in complex ways. These interactions might in theory be predictable but cannot in general be fully described or predicted. The open system is "equifinal"; that is, whatever the input to the system, the characteristics of the system define the outcomes, or similar inputs may be transformed differently by the system to produce rather different outcomes.

Additionally, systems have an "inertia" or persistence of a general pattern of characteristics, direction of change, apparent goals, and so forth. This gives the system its stability, whether a school system or a child, so that it has a continuing identity over time, and a core of persistent characteristics, processes or structures, even if these change or adapt to the environment over time. So one cannot predict the precise effect of input, but one can expect the individual to have some stability and predictability. A system (child, school or family) seeks equilibrium, although never permanently achieved, with the environment by interacting with it in dynamic ways. The environment and the system can be distinguished only arbitrarily; it is clear that as two interacting systems, the system and its environment affect one another.

Many of these concepts are to be found in the many years of work by Piaget (1966, 1971) on the development of the child, including his concepts of assimilation and accommodation, and in particular of equilibrium. His later work brings out clearly this underlying equivalence to "systems theory". What is also of interest in Piaget's work and in general systems theory is the observation that "process" or "function" (the ongoing pattern of behaviour, change in response, linking of previous experience to present environment) turns into "structure", or fixed patterns or mechanisms, persisting over time and with a definite form and purpose, for example a conceptual structure, a pattern of motor skill, an "ability". These more or less established structures in turn filter, adapt and are adapted to incoming process.

In other words, the system is permanent but it grows. What was in the process of becoming and adapting becomes a part of the system. The process of the acquisition of language illustrates many "system" characteristics. Language itself is a system--of grammatical relationships, of meanings, of phonological patterns and their relationship to meanings--and as it develops, it differentiates and integrates, subsuming previously learned skills and discriminations into larger units. It is fixed as a major pattern but grows by adaptation, not simply accretion of elements. It has been claimed that language acquisition cannot be mastered by purely linear, stimulus-response patterning and addition of units of performance; language is recursive.

I suggest that one sees, in the complex interaction of the child with the elements of his or her own development and with his or her environment, the kinds of transactions which characterize the most complex of "open systems". This is why the child shares the adaptive ability and the unpredicability of the complex system.

COMPLEXITY OF SYSTEMS

To describe, explain and "predict" (or control change) as far as we can, we must understand in more depth the implications and the relationships involved in complex systems. They are dynamic and not the linear, causal relationships of conventional statistics and conventional research design. To me this suggests that we must begin to look in the direction of statistical theories such as decision theory (Cronbach & Blaser, 1957) and the "sequential analysis" model of statistical design and interpretation proposed years ago by Wald (1947, 1950) estimating the limits within which a system is likely to operate, and defining the tolerable errors before there has to be an interference.

More generally, perhaps, one needs to look at the implications of Bayesian (Bayes, 1761) assumptions and statistical approaches as contrasted with the classical significance-testing model. Whatever may be our advances in the future towards finding more effective research models and statistical analyses, we must develop ways of understanding, describing, and analyzing the adaptation and development of complex systems. This, it seems to me, is the only kind of theoretical framework which will adequately cope with the complex state of affairs described by Dr. Shipman, so that we can understand, manage and hopefully replicate the efficient and humane interventions, rather than "predict" somewhat inefficiently.

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EARLY IDENTIFICATION AND INTERVENTION

Sheila Wolfendale

INTRODUCTION

This paper attempts to provide the theoretical and conceptual framework for the approach to educational and learning problems that has come to be known as early identification, particularly as it relates to developments in the United Kingdom. This paper also demonstrates how a variety of influences have had bearing on the practice of early identification assessment, and on the spectrum of children in ordinary schools to whom it applies.

It is perhaps worth reiterating the definition of screening, as a procedure seeking to identify numbers of children simultaneously, but not aimed at those children whose developmental and educational handicap (physical, sensory, intellectual, and behavioural) are of such severity that they identify themselves. It is because developmental delays and learning difficulties are of less immediate and apparent severity that they may initially elude the trained professional and, therefore, require precise techniques of recognition. The paper goes on to delineate and define intervention within educational contexts, giving examples of current work in this field.

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An approach to early identification of children's learning difficulties represents a movement in America, Canada, Australia, Europe, and the United Kingdom. Common threads amongst these can be discerned:

1. *Common aims and objectives:* These encompass three aspects: detecting early signs of education failure; taking consequent educational action; and averting or reducing failure and wastage of human potential, related to early environmental disadvantage. These aims can be summarized as humanitarian and educational primarily, against a political and economic backcloth.

2. *Target ages of early identification screening:* Three age clusters can be distinguished: preschool category; on-entry to school (which is age five in the United Kingdom); and one to two years after entry to school.

3. *Content and components:* The instruments sample the main skill and developmental stages that can be measured and that (ideally) are considered to have direct bearing on educational tasks and the requirements of the curriculum. They vary in specific purpose and emphasis in certain sub-areas.

I. INFLUENCES IN THE UNITED KINGDOM

If the early detection of children's learning difficulties is to be regarded as a legitimate growth area within the last few years, it is necessary to identify the main past and present influencing factors. The following eight trends, while describing influences in the United Kingdom, have implicit relevance for international practice in the English speaking world.

1. *The Plowden Report on Primary Education and the Work in the Educational Priority Areas*

Several national projects were generated by the publication of the Government's Plowden Report (1967), which identified large numbers of disadvantaged children clustered in certain geographical areas. These were designated as educational priority areas (E.P.A.'s) for which extra material and manpower resources were provided and which were the focus of intervention programs. The idea of "positive discrimination" embodied in the *Report* focused attention on ways and means of intervening socially and educationally, particularly in the lives of preschool children (Woodhead, 1976) and raised various issues, such as the need for early action and the appropriateness of preschool nursery curricula (Tizard, 1974). The Swansea Evaluation Profiles[1] (Evans et al, 1978) represent an attempt to research pre- and post-school factors governing success in, and adjustment to, school.

2. *Concern Over Reading Standards and the Effects of Remedial Reading*

In 1972, a Government-appointed Committee, which was set up to examine the concept of dyslexia, submitted its report (Department of Education and Science [D.E.S.] *Green Paper,* 1972). The Committee chose the term "specific reading difficulties" to describe the syndrome usually associated with the use of the term dyslexia, and suggested that "teachers will notice any indications of reading disability during the first years at school, but at some stage a systematic screening of all children will be necessary" (p. 4). Furthermore, the report stated that, "in collaboration with educational psychologists and school medical officers, teachers should screen all children for reading backwardness, preferably at the end of the infant stage" (p. 8).[2]

This suggestion that reading and learning difficulties could be detected early in a child's school life was endorsed by the *Bullock Report* (1975) set up by the Government to consider all aspects of teaching the use of English, including reading, writing, and speech. The Committee members addressed themselves to the origins and manifestations of reading difficulties, unequivocally regarding the early detection of educational failure as a priority. One of their main recommendations was that "local education authorities and schools should introduce early screening procedures to prevent cumulative language and reading failure and to guarantee individual diagnosis and treatment" (p. 515).

Allied to general concern over children's persisting reading difficulties has been the growing dissatisfaction with the relative ineffectiveness (in terms of measurable, long lasting gains) of remedial reading, carried out in schools as an adjunct to the main curriculum. The assertion is that traditional remedial provision is less effective than the preventive measures or early identification and action (*Bullock Report*, 1975, Chapter 18, "Children with Learning Difficulties").

3. *The Move Away from Norm-Referenced Assessment*[3]

Teachers and psychologists are now aware of the limitations of formal I.Q. tests and standardized tests of attainment that do not relate to curriculum content. Traditionally, large scale screening has taken the form of administering reading and non-verbal intelligence tests to seven and eight year old children, and in fact the practice is still prevalent. The diagnostic information yielded from these standardized global measures, is, however, minimal. Gradually these measures are being replaced by criterion-referenced assessment,[4] including early identification techniques, teachers' check lists, and functional assessment (Wolfendale & Bryans, 1979a).

4. *Developmental Perspectives*

In the last few years there has been a burgeoning of interest and research into early child development and early learning (Tizard, 1974; Wolfendale & Bryans, 1979a). Much of this research aims to link early child development principles and empirical evidence with educational practice, the overall aim being the creation of opportunities and systems which optimize children's potential. The rationale of an early identification procedure within a developmental framework is that both strengths and weaknesses of learning behaviour can be detected in time for appropriate action to be taken. If learning failure is to be identified from the earliest years, the methods used must be broadly based enough to take account of the whole range of major influences on child behaviour and functioning. This theme is developed later in the paper.

5. *Evidence from Surveys and Epidemiological Studies*

Linking directly to concepts of disadvantage and children's needs (Kellmer Pringle, 1975) has come an abundance of data from longitudinal studies of children's development, and from surveys of the incidence of childhood problems in the general population, mainly from the National Child Development Study (based at the National Children's Bureau in London, England, Steedman & Fogelman, 1980). The evidence confirms that children lacking material resources and varieties of experience from birth fare worse in school than children who are seen to be advantaged in these respects, and the comparative attainment measures of advantaged and disadvantaged children underline this.

Thus, one strand of the rationale underlying early identification procedures is that of the "compensatory intention"--to provide maximum possible educational opportunities to children considered to be "deprived". The concept of "deprivation" is hedged around by conceptual and ideological debate but should not obscure the humanitarian and educational intention of compensatory education approaches.

6. *Paediatric and Medical Influences*

Along the lines of the adage "prevention is better than cure", many of those in the medical profession concerned with developmental paediatrics and child health have, during recent years in the United Kingdom, come to support the idea of regular monitoring of the overall development of young children. The Government Report, known as the *Court Report* (1976) on child health services, drew attention to and emphasized the importance of early assessment in these words: "Educational failure should be recognized early and requires precise diagnosis just as much as physical disease, for many difficulties at school could be anticipated before school begins" (p. 11). This report recommended a comprehensive system of preschool surveillance, defined as the monitoring of children's developmental progress with reference to speech and language, manipulative and sensory-motor skills, mobility, emotional-social development and social relationships.

Several local education and area health authorities in Britain are currently developing and piloting forms of preschool developmental assessment. Some of these include on-entry to school procedures, some are primarily medical-developmental, and some exemplify a multi-disciplinary team approach. A review of some of the current work is contained in Wolfendale (1979).

7. *The Role of the Local Authority Educational Psychologist*

Reflected in journal articles and contemporary texts (see, for example, Gillham, 1978) is the growing professional unease amongst British educational psychologists[5] because they cannot effectively cope with a clinical/casework approach to their work. This has traditionally relied upon a belated-reactive model where other people (such as teachers, social workers and others who are all agents of referral) define the problem at a point when it is often irreversible or intractable.

Many psychologists, in re-appraising their workloads, are moving towards a less crisis-oriented way of confronting and communicating with their clients, namely, children, teachers and parents. Two areas of involvement exemplify a "preventive" type of intervention: early identification screening and in-service education of teachers. Other areas where psychologists are beginning to apply their own expertise are those of behaviour modification techniques for learning and behaviour problems, a skills analysis approach to learning, process and product variables within the classroom, and formal and informal assessment of children's functioning. Assessment via early identification of children's functioning and learning "sticking points" provides a vehicle for "fine grained" analysis of many of these interactive classroom factors.

8. *The Warnock Report (1978) and Special Educational Needs*

In May 1978, the Government Committee of Enquiry into the education of handicapped children and young people produced a report comprising a seminal review of current policies and provisions in the area of special education, in addition to putting forward sets of recommendations. Of these, the main policy change recommended is that of integration or mainstreaming--to abolish, over time, the notion of separatist education for all but the most severely handicapped children who require specialized teaching and support, often in residential settings.[6] It is envisaged by the Warnock Committee that the majority of children with special educational needs will be in ordinary schools. The Committee members feel that "a meaningful distinction between remedial and special education can no longer be maintained" (p. 47).

Concluding, on the basis of evidence from the longitudinal and epidemiological surveys referred to earlier in this paper, that "up to one in five children are likely to require special educational provisions at some time during their school career", the Committee goes on to suggest that this means "that the majority of children with special educational needs will have to be not only identified but also helped within the ordinary school" (p. 95).

The Warnock Report is thus the latest "official" report to specify the necessity for early recognition and acknowledgement of emerging developmental or learning difficulties. The *Report* is proposing an approach in ordinary schools to children's developmental, learning and adjustment problems which consists of the use of appropriate methods to identify the children with special educational needs and which then precisely locate and describe an individual child's difficulties. "Special educational provision" (intervention) is then to follow.

II. THE GROWTH OF EARLY IDENTIFICATION SCREENING

Having traced the main influences contributing to the growth of this area, some of the main theoretical and pragmatic aspects will be discussed. The focus of concern has been those children who apparently "fail the system" and who are designated, on various criteria, as having learning problems, as not reaching a required standard, as underachieving, or as being unable to compete with peers.

A "deficit" or slow-learner model which separates failing children from successful children may well be replaced by the belief that the system fails the child if it does not provide the appropriate intervention on his or her behalf, using, amongst other techniques, criterion-referenced observation and assessment schedules.[7] Compilers of screening instruments have to resolve the following questions:

- does the instrument pick out the target children?
- does the instrument pinpoint their learning difficulties?
- does the instrument point to positive ways of intervening?
- is the instrument a valuable and effective aid to teaching?

Current screening procedures can range from simple pragmatic tools that aid the teacher to detect and help the children in special need, to sophisticated and complicated diagnostic measures based on elaborated theory.[8] The format of the procedures can include:

- individual developmentally oriented child profiles, where each item is marked with a tick or a Yes/No Category by the teacher (example: Croydon Check List, Appendix To T. Bryans, "Some issues in the implementation of an early identification procedure" in section 2 of this volume);
- individual child profiles where functioning on each item is rated on a five-point scale by the teacher (example: Lindsay, 1979);
- branching technique: the teacher records "Yes/No" against an item, and where "Yes" is ringed, the teacher is directed to specify the problem in more detail (example: The Wigan Check List, Yates, 1979);
- performance-based schedules, approximating to tests, where children are required to give oral or pencil-marked (copying, drawing) responses to task items (example: The Bury Early Infant Learning Check, Pearson & Quinn, 1979).

Common Components to Screening Procedure

The general aim of screening procedures is to explore children's functioning and manifest competence across as wide a developmental spectrum as possible, which is usually conceptualized into several areas. The items within each area have been chosen because: (a) they reflect approximate levels of maturation for the given age range, where performance is evident and not merely inferred; (b) the behaviours they describe are seen as necessary and attainable goals for the infant curriculum as it is constituted at present; and (c) they reveal the delays or problems which would be amenable to extra or specific teaching help.

As Trevor Bryans discusses in his paper in section 2 of this volume, the content of identification measures has to be based, to some extent, on assumed links between early and later learning processes. Below is a list of the four main developmental and skill areas included in most early identification measures.

1. Speech, language, communication: this area includes items on speech, articulation, receptive language, listening skills, comprehension, expressive language, oral memory, and the social use of language as the main means for communication.

2. Perceptual-motor (also called sensory development, physical skills, both gross and fine): this type of section explores general perceptual-motor development and its bearing on curriculum expectations as to general competence in gross-motor activities (agility, in movement and with equipment, and alertness), fine motor activities (writing, drawing, cutting, constructing) and reading-readiness related activities (visual discrimination, form perception).

3. Emotional-social development (also called general social behaviour, social maturity, personal and social adjustment): the teacher is required to gauge and record the extent to which the child has settled in to school, to working and playing with peers, to relating to adults, and to coping in a social/learning environment.

4. Learning style, attitude to learning, response to learning situations: in this category the teacher explores the child's task strategies, attention to and persistence with assignments, level of distractibility and motivation.

Additionally, some, but not all, identification techniques have items on early reading skills, early number and basic number concepts.

The psycho-educational aims of early identification procedures are to identify the nature of children's learning, their emerging learning difficulties, developmental delays, skill areas needing specific training, and interactive factors, such as teachers' expectations, and the appropriateness of curriculum tasks for children who are not coping.

The term "learning difficulties" subsumes a variety of presenting educational problems and in view of the *Warnock Report* (1978), encompasses slow learning children who have been classified as "educationally subnormal", as well as children who, in North American terminology, are "learning disabled". In all the percentage of children having special educational needs in learning and behaviour categories in ordinary schools is said to be ten to fifteen percent (Leach & Raybould, 1977; Warnock Report, 1978)

It still must be established whether this target group of children can be accurately identified early on in their school lives. Attempts to hold variables constant in order to chart this area are bedeviled by developmental discontinuities, sign and symptom variability over time, bluntness of criterion and predictor measures, uncertainty over links between early and later learning, effects of intervention versus "normal" education, and the rôle of the teacher. These and other theoretical and methodological issues have not deterred psychologists from attempting to develop and try out forms of early identification and follow-up in order to "make special provision for *all* children with learning difficulties" (Moseley, 1975, p. 132).

On that basis, there are various requisites to which early identification screening procedures should conform, even if all the technical requisites of test construction cannot be fully met. The general requisites would be: the application to educational practice of research findings and prevailing theories regarding principles and processes of child development and learning behaviour; the creation of a framework within which there is agreement about the behaviour to be observed, so that there is a unified perception of the defined problem on the part of personnel with differing training backgrounds and professional emphases; the need for accurate, precise recording as a basis for communication and action, understandable by the teachers using it; and the need to have the form of observation clearly linked to teaching content and the teacher's goals for individual children.

Rôle of the Teacher

If the teacher is the key agent of educational change in children, the screening exercise must be seen to be relevant, purposeful and viable to him or her and the rationale clearly understood, once the screening becomes policy within the school. The relationship between the content of the identification measure and the content of the curriculum must be explicit.

Some of the prevailing screening systems have been developed as a direct result of teachers' concern that they are not equipped with appropriate expertise to detect and deal with a range of learning difficulties in the classroom, and that the traditional referral system for support from the school psychological service is time-consuming and cannot reach all the children with special needs.

Thus the justification for an early identification on the part of teachers is that it provides: a framework for communication with colleagues about individual children; a perspective against which to assess and record children's development and progress; a regular review point; a basis on which to match the learner and the task; and opportunity for teachers to pinpoint the nature of early learning difficulties before failure is intractable and irreversible.

Recent evaluative work (referred to in Trevor Bryans' paper in section 2 of this volume) is confirming that teachers' own judgements and predictions are on the whole reliable, except for the caveat that the teachers have to be well informed and sensitive to the criteria they are employing when making decisions about individual children. The premium is on initial and in-service teacher training in this field of special educational needs.

III. INTERVENTION

The term "intervention" has been used on both sides of the Atlantic in association with disadvantage and compensatory education. Head Start, Follow Through,[9] and Educational Priority Area projects have generated a whole range of specific intervention approaches, which have included school based programs, home-school links and community ventures. They have concentrated on the preschool and beginning school years.

Thus, "intervention" has been used to denote particular and specific action designed to bring about change that would not necessarily have come about without such intervening action. The hypothesis is that in the normal course of events, factors governing change towards the desired social or educational end are imperfectly understood or controlled and therefore only have chance occurrence or incidental influence. Planned intervention using goals and appropriate sequences of action designed to achieve these is therefore reckoned to be an effective means of bringing about desired change: to develop parents' awareness and understanding of child development and educational aims; to bring about constructive communication between home and school; or to raise levels of functioning in subject and skill areas.

Many seminal studies (Hess & Shipman, 1965; Heber et al, 1973; Shearer & Shearer, 1972) have demonstrated the powerful effects of a total community/parent/professional involvement in children's lives. Woodhead (1976), in concluding his review of British research into preschool education for disadvantaged children, mentions that teachers (in nursery schools) cannot exclude the involvement of parents and the wider community. "Only by being aware of these other influences and adapting the program accordingly can the teacher claim to be concerned with the education of the 'whole child'." (p. 94)

This writer concurs wholeheartedly with this view--that schools have to evolve policies and philosophies of positive intervention embracing local ethos, parental aspirations and parental needs. However, the term "intervention" as it will continue to be used in this paper refers to educational intervention--that is to say, action that teachers and schools can take and the policies they can pursue. Thus, although their ventures may involve parents and the community, the perspective is the school's and the emphasis is educational.

A Developmental Rationale for Identification and Intervention

Hunt (1966) affirms the view that we are justified in intervening from birth to develop each child's potential. He suggests enrichment programs for children at various levels of development and for schools to "try out" their effectiveness empirically (p. 75). He is advocating a sustained follow-through of appropriate educational experience which relates to the child's developmental level. Deutsch (1965) endorses this view, and states that "it would seem in the long run that the most effective remedial and enrichment programming would have to follow developmental stages" (p. 88).

Current early identification techniques are couched within a developmental framework and are designed to be followed by intervention strategies "based on a thoroughgoing evaluation of children's strengths and weaknesses and supported by a clearly perceived framework of developmental objectives" (Evans, 1979). The thinking behind the Croydon Screening Procedures, for example, especially at the initial stage of the Check List, is developmental. The identification intervention model is embodied and elaborated in Wolfendale and Bryans (1979a).

A developmental approach can provide a broader baseline from which to plan intervention programs for developmental or learning difficulties without having to adopt and be wedded to specific syndromes such as learning disability, specific developmental dyslexia, or educational subnormality, where the supporting evidence is tenuous and shaky. The text for teachers of three to five year olds by Butler et al (1975) exemplifies this dual approach: specific developmental objectives are used to plan programs which are highly individualized and which "respect the patterns of development of individual children as well as the general characteristics of a population of preschool children" (preface). In this book, suggestions designed to avert or pre-empt later failure, are made for particular levels of development.

Within a developmental framework we may discern: sticking points in skill acquisition; varieties of task-approach strategies and learning styles; stress points at task difficulty; and variabilities in motivation to sustain involvement and application. These potential sources of "learning difficulty" will manifest themselves in lack of progress in subject areas of the curriculum, particularly in basic literacy and numeracy. Their key importance as precursors to later academic subjects is such that "failure" manifested in them will almost inevitably generalize. It is *not* at the earliest stages of learning difficulty that labelling is carried out; it *is* once a pattern has been established. Thus, it is to avoid labelling that early identification of the earliest signs of learning stress is advocated.

Features of School-Based Intervention

It is necessary to distinguish between the breadth and variety of normal curriculum provision in the first years at school and "intervention for a purpose". Intervention is regarded as the introduction and inclusion of a school based, specific, structured curriculum program which can be either short or long term, but which is based on explicit objectives regarding the skills to be learned, teaching and learning sequences, and measurable progress that it is hoped will be made by the children. Intervention approaches should be designed to be compatible within the wider framework of a school curriculum where there are a wide range of educational objectives and applications.

Wolfendale and Bryans (1979a) delineate three types of school based intervention and advocate the adoption of one or more of these as part of a school's intervention policy. The three types are:

1. Content programs: In these, the main focus is on the content and the materials, for example, a structured language program, a perceptual-motor training schedule, a scheme or kit.

2. Method programs: In these, teaching style and attitude are paramount in presenting the material to be learned. For example, a teacher may decide to adopt a teaching approach which is characterised by frequent reward for learning goals attained by the children. The use and deployment of para-professional help, teacher's aides, or parents illustrates another form of a method program where the underlying assumption is that learning is facilitated by certain kinds of classroom organization and adult-child relationships.

3. Process programs: These are specific techniques designed to focus closely upon classroom practice which directly affects teaching and learning. These can include teachers' attitudes and children's responses to learning opportunities. Techniques of observation of classroom interaction could come into this category.

Some intervention programs are based on the premise that some children benefit very little from normal school provision. If this is so, there have to be certain requisites for the intervention: it has to be based upon prior identification of the children who are thought to be in need; it is not enough to provide a temporary "boost" which will lead to "fade-out" of the effects--gains must be longer lasting; and it must comprise clear goals, carefully thought out sequences of instruction, and means of evaluation.

Wolfendale and Bryans (1979a) go on to suggest three main aims of intervention--enrichment, redirection, training--and provide models of intervention programs which incorporate evaluation strategies, in the main developmental and skill areas of language and communication, perceptual-motor processes, emotional-social development, and development of learning competence.

This work can be described, along with other examples, as current British explorations into intervention at the preschool and beginning school levels. These current explorations can be divided into two types: (A) projects exploring the effects of specific, structured goal oriented intervention, which aim, too, to look at processes of teaching and learning; and (B) general programs and texts outlining approaches in specific skill areas, within a formal and conceptual framework. These may be based on a prior project, where teachers actively participated, along with the researchers.

EXAMPLES OF A

1. "Improving children's learning skills; implications arising from a short-term intervention programme in an infants' school" (Green et al, 1979).

The two objectives of the study were to identify inappropriate learning behaviours which may be hindering the process of learning in school and to test the effects of two teaching programs. The authors feel that the screening and intervention programs (based mainly on Stott, 1971, 1978) "demonstrate one way in which teachers have been able to undertake a guided programme of assessment and intervention, with the minimum of support from outside 'experts'" (p. 21).

2. "Intervention for disadvantaged pre-school children: an active research programme to extend the skills of day nursery staff" (Laishley & Coleman, 1978).

This was designed as an exploratory study to examine the relative advantages and disadvantages of an attempt to positively intervene. The three programs used were a development assessment form, a series of workshops on coping with behaviour problems, and workshops on language development.

3. "'High-risk' screening and school-based intervention" (Thomas & Evans, 1979).

This project, funded by the British Department of Education and Science, has sought to identify children "at risk" educationally and socially, and to provide them with small-group daily intervention along specific lines. Initial reports are encouraging and the co-directors feel that "it cannot be emphasized too strongly that the school must be seen as the principal agency involved in the educational intervention for disadvantaged children" (p. 285).

4. "Intervening with learning in the infant school" (Wolfendale & Bryans, 1980).

This small-scale project took place in a Croydon infants' school over eight months. Six children aged between five and six years, regarded as having early signs of learning difficulties, received small-group daily intervention from their class teacher for thirty minutes (the rest of the class being taken by the headmistress for that period). The content consisted of language work and perceptual-motor training activities A key feature was "teaching points", or ways in which the teacher was encouraged to elicit active participation and responses from the children, as well as reduce distractible behaviour. Pre- and post-testing was employed, and the children showed substantial gains. One aim of the project was to explore pre-referral (to support services) features as well as the feasibility of conducting intervention programs as a collaborative exercise as part of school routine. The teachers reported positively that such collaboration is indeed possible.[10]

EXAMPLES OF B

1. *Handbook for Teachers* (Bryans & Wolfendale, 1979b, 1979c; Wolfendale & Bryans, 1979b).

These separately published intervention programs cover language development exercises, perceptual-motor training, and suggestions for learning and behaviour management, and include ways of recording, monitoring and evaluating. They are developments from the *Guidelines* booklet (Bryans & Wolfendale, 1973) used as a basis for intervention approaches following on from the early identification system used in the London Borough of Croydon.

2. *Language Development and the Disadvantaged Child* (Downes, 1978).

The language program in this book was developed as part of the Schools' Council Project in Compensatory Education in the infant school. The purpose of the handbook is to provide suggestions, examples and guidelines for teachers working with infant children who are disadvantaged in terms of their language development. Seven language skills are outlined.

3. *My World* (Curtis & Hill, 1978)

This handbook of ideas for teachers of preschool children is described as a thematic approach to meeting the needs of socially handicapped children. The ideas are based on an N.F.E.R. project where researchers worked closely with teachers. The resulting program was tried out in a number of schools in thirteen local authorities over a period of two terms. The themes cover Myself, Clothes, Home, Family and Community, Food, Animals, Transport, and Seasons. The authors outline five major areas in which young socially handicapped children are most likely to be affected. These areas pertain to weak self-image, language difficulties, low levels of concentration and motivation, poor conceptual and problem solving abilities.

CONCLUDING REMARKS

There is considerable uncharted territory to explore. We have had to concentrate on the rights of those children who are, at present, still being failed by the educational and social system, and our responsibilities have taken the form of providing "catching up" instruction--remedies, like drugs or medicine.

We have yet to evolve an educational philosophy that embraces all children, that allows individuality to flower without recourse to the competitiveness of norms and to the concept of failure in not achieving society's expectations of competence. On the basis of what we are discovering in this field so far, can we not discover ways of identifying all children's potential contributions to society, to ensure that all are valued?

FOOTNOTES

[1] The Swansea Evaluation Profile (Evans et al, 1978) is a screening procedure which could help to identify school entrants needing compensatory education and consisting of three sections. Two of these are designed to gain information on home background and to assess initial adjustment to school; the third is a battery of cognitive tests.

[2] In the United Kingdom, compulsory education begins at age five years. Infant school usually spans the age range five to eight years.

[3] Norm-referenced assessments are measures in which the meaning or level of a child's performance is calculated by reference to a set of standardized norms previously gathered on a sample representative of a specified population.

[4] Criterion-referenced assessments are measures in which the meaning or level of a child's performance is established by comparing it with a pre-set standard.

[5] British educational psychologists are employed by local education authorities (the equivalent of school boards in Ontario) to provide a psychological service for children, mainly in schools.

[6] These are the identifiable handicaps of a severity or complexity that warrant specialist teaching and specific, often expensive resources that cannot be justified on cost-effectiveness grounds in ordinary schools. The *Warnock Report* does not specify precise criteria for handicapping conditions; rather, it recommends multi-stage, multi-professional assessment procedures and locally-based review boards to assess the incidence of handicapping conditions, to make appropriate provision, and to meet individual children's needs.

[7] Some of the technical aspects pertaining to test construction are currently being explored in the United Kingdom (see literature review,

Wolfendale & Bryans, 1979a). Some examples are studies on predictive validity (Lindsay, 1979; Raybould, 1979), concurrent validity (Kingslake, 1977), and item analysis (Potten, 1979).

[8] Contained in several chapters of Wolfendale and Bryans (1979a) are examples of early identification screening instruments currently being tried out, in the main by educational psychologists, with the assistance of advisory and teaching colleagues. The target age range of the instruments is for children aged five to six-and-a-half years (school entry being at five years, with a smattering of "rising fives" from four-and-a-half years of age).

[9] "Follow Through" is the name given to U.S. Government-backed compensatory education programs. These stemmed from the earlier American Head Start programs, which were launched to combat the effects of social and/or educational deprivation.

[10] A fuller description of this study can be found in Trevor Bryans' paper in Part Three of this volume.

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THE PREDICTION OF READING FAILURE: A REVIEW AND CRITIQUE

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INTRODUCTION

I propose, in this paper, to limit my discussion to the early identification of and intervention with children with reading problems, here taken as a paradigm of learning problems. Early identification has as its purpose the detection of those children whom, in comparison with their peers, we predict will have difficulty learning to read in the primary grades. Early identification is the first part of a three part preventive program which involves early identification or scanning, diagnosis and intervention.

Two general questions immediately arise. What causes reading difficulty, and how can we recognize it before it reveals itself in reading failure? The definition used here implies that reading difficulty is but a symptom, resulting from many forces acting upon the child and many forces from within. These forces may be biological, psychological, social and educational, in any and all combinations; and thus the causes of reading difficulty are diverse. They may be found in prenatal, perinatal or neonatal stress; they may be genetically determined; or they may result from inappropriate stimulation at

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critical ages for language development. Others may have their cause in inadequate or inappropriate education, while for some the specific cause cannot be determined. And of course in any individual child, more than one cause, acting in concert, may be found. From an etiological point of view, then, learning difficulty is heterogeneous.

ETIOLOGY OF READING FAILURE

The importance of this diversity in etiology is two-fold. The first implication is that the identification and removal of causes of reading disability are not simple matters, encompassing as they may the control of prenatal, perinatal and postnatal organic defects; modifying the emotional, perceptual and language environment of the first three years of life; and changing the educational curriculum in kindergarten and in the first grade. Overwhelming as these tasks of primary prevention appear, they are not to be dismissed as unrealistic.

For example, data are gradually appearing in the literature based upon the Collaborative Perinatal Project (Broman et al, 1975) designed by the American National Institute of Neurological Diseases and Blindness as a prospective study of pregnancy and pregnancy complications. These data confirm earlier studies on "reproductive casualties" (Lillienfield et al, 1955; Kawi & Pasamanick, 1958; Balow et al, 1976), and identify specific elements in prenatal nutrition, medication and drugs; in obstetrical complications, medications and procedures which contribute to such behavioural defects as short attention span, low intelligence, hyperactivity and reading disability (Brackbill & Broman, 1978). The field of behavioural teratology, the study of fetal anomalies, has received great stimulus from such research. Amniocentesis to detect chromosomal anomalies is now an established procedure, as is metabolic screening of neonates to detect inborn metabolic problems. Reducing the incidence of these organic defects is a contribution to the primary prevention of reading disability. Just how many children with reading problems suffer from such organically determined defects is unknown. Silver and Hagin (1972), however, found in a sample of the entire first grades of the lower east side of Manhattan, that twenty percent of the children with reading problems had neurological signs.

The importance of social position of the mothers is emphasized in another study of the Collaborative Perinatal Project (Broman et al, 1975). Modest attempts to alter the effects of poverty and of maternal style have been made in Head Start (Cicirelli, 1970; Datta, 1969; Smith & Bissell, 1970) and in early education programs such as those of Bereiter (1972). Highlights of validated programs funded by the United States Office of Education's Early Education Project (1975) may be obtained from Handicapped Children's Early Education, Bureau of Education for the Handicapped.[1] We are still, however, for the most part, limited to secondary prevention, to detect, independently of cause, those children likely to fail in reading, and to intervene before failing occurs.

The second implication of heterogeneity in etiology is that we cannot expect a scanning instrument for early identification of reading disability to detect all of the etiological factors. Scanning, therefore, is not diagnosis. It does not tell us the cause of the child's problem. It is not primary prevention. At best, it is a component of secondary prevention; that is, a means of preventing the development of failure even though the causative factors in that potential failure are not removed. This leads to the second question raised above. How can we recognize the potential for reading failure before it becomes reading failure? This question has been approached in three ways:

1. Retrospective studies: Here the attempt is to define the neuropsychological correlates of children who have already failed in reading and use this knowledge in testing children at ages four and five.

2. Prospective studies: To attempt to define those skills necessary for reading and to test predictive instruments based on these findings. Some of these studies are based on a comprehensive theory and some are not.

3. Combination of each: That is, defining the neuropsychological correlates of reading failure; from these, developing a theory of reading and from that theory, postulating the antecedents which will predict failure.

SYMPTOMS OF READING FAILURE

Certain warnings are, however, in order. Just as children with reading problems differ as to the cause of their problems, so will they also differ in symptomatology. Within a group of children designated as showing reading disability, there are marked individual differences in function and a wide range of distribution of assets and deficits. These may appear in all aspects of receptive, associative and emissive language function, in all aspects of dysgnosias, dyspraxias and dysphasias[2] (Silver & Hagin, 1960, 1972).

The importance of these variations is that in a statistical survey of large numbers of children, individual differences may well cancel each other out. The investigator may dismiss as unimportant some variables which may be crucially important to some children in the sample (Silver & Hagin, 1978). As a further caveat, comparisons between children with and without reading problems must be made in groups matched for age, sex, socio-economic status, educational opportunities, and functional intelligence, as well as for the presence or absence of organic and psychiatric factors (Parson & Prigatano, 1978). Such information concerning the populations studied is frequently lacking from neuropsychological investigations, rendering their interpretation most difficult.

With the above caveats, review of retrospective studies indicate that positive association of a modest degree has been found between reading retardation and deviant performance on a variety of tests making demands on perceptual, linguistic, sequencing and intersensory integration abilities (Rourke, 1978; Doehring, 1978). But just as frequently has literature reported no significant differences in these functions when good and poor readers are compared (see, for example, DeHirsch, 1972). It is understandable that because of the heterogeneity in etiology and in symptoms, and because the picture of reading disability varies with so many factors such as age, sex, socioeconomic status, and educational support, the findings even in multivariate studies may yield different results.

STUDIES ON READING FAILURE

Prospectively, as far back as 1928, Nila Banton Smith found in two hundred children that letter matching testing in the first grade yielded a high correlation with a word recognition test given twelve weeks later. Visual discrimination of letter size and shape (Silverston & Deichman, 1975), as well as visual discrimination and knowledge of letter names (Barrett, 1965a, 1965b) were found of value as predictors. Auditory discrimination of beginning sounds was emphasized by Dykstra (1967). Hammill and Larson (1974), however, found that auditory discrimination, auditory memory blending and audio-visual integration were not useful in predicting reading ability. Bond and Dykstra (1967), in a review of the Cooperative Research Program in first grade reading instruction, concluded that auditory or visual discrimination and intelligence are related to success in learning to read. The presence of language defects is used by Vellutino (1978) as predictors of reading failure. Linguistic theory (Goodman, 1968) suggests that reading is a form of linguistic processing dependent upon the reader's psycholinguistic background. Farr (1969) has suggested that skills related to beginning reading are those which cluster around the ability to decode written symbols, develop a sight vocabulary and use word attack skills. Content analyses (Beecher & Goldfluss, 1978) of a selection of reading and readiness tests reveal a striking similarity to the components which Monroe used in 1935, and in general, conform to Farr's admonition. Specifically, the readiness tests cover a wide range of skills involving visual letter and word discrimination and knowledge, visual-motor function, auditory discrimination and recall, sequencing and comprehension, vocabulary, articulation, emissive speech, intermodal integration, concept development, and gross and fine motor abilities.

What is obviously needed is a unifying hypothesis that brings together the diverse findings of both prospective and retrospective studies. The validity of such an hypothesis would enable the building of an instrument which would predict no later than kindergarten which child was to fail and which child was to succeed in reading. Such theories have been proposed by Satz et al (1970), Jansky and DeHirsch (1972), and Silver and Hagin (1975).

Satz has postulated that children who will fail in reading lag in the development of those skills which he presumes to be critical to early phases of reading, namely perceptual discrimination and analysis. He further states that kindergarten children who are failing at reading will "eventually catch up in those earlier developing skills, but will subsequently lag in the conceptual linguistic skills which have a slower and later ontogenetic development" (Satz et al, 1978, p. 319). What Satz has postulated is a specific lag in development, but as maturation overcomes one set of lagging skills, the next hierarchal set will also lag. Accordingly, a cross-sectional study at different ages will of necessity yield different areas of deficit. The perceptual skills described by Satz (namely finger localization,[3] alphabet recognition and discrimination) together correctly classified seventy-seven percent of the children into adequate readers. Unfortunately, the high percentage of correct prediction at the end of first and second grade falls to fifty-seven percent in fifth grade.

Jansky and DeHirsch (1972) stressed the importance of the ability to retrieve stored verbal symbols, and to comprehend and use oral language as factors predictive of success in reading. Their prediction battery is composed of a variety of test items, of which the five best predictors of reading success or failure were letter naming, picture naming, word matching, the Bender, and sentence repetition (Binet). Jansky and DeHirsch (1972) state that "three of these activities, letter naming, copying the Bender designs, and word matching, can be considered hardy perennials" (p. 57). This battery, administered in the spring of the kindergarten year, correctly predicted seventy-five percent of failing readers in the second grade.

In looking at the reference literature, it is interesting to note that neither the Satz battery nor the Jansky-DeHirsch screening index is listed in the Cross-Goin Guide to Case-Finding, Screening, Diagnosis, Assessment and Evaluation of Handicapped Children (1977). Of the ninety-eight tests listed by Cross-Goin, sixteen are considered as scanning instruments. Some of these are designed for children to age eight and can hardly be used as predictive batteries. Others are designed for specific handicaps, such as auditory acuity, or fine and gross motor performance. Those batteries testing language and/or perception, and specifically standardized for the kindergarten child, number only four and include the ABC Inventory[4] (Adair & Blesch, 1965), the Eliot-Pearson Screening Profile[5] (Meisels & Wiske, 1976), the Meeting School Street Screening Test[6] (Hainesworth & Siqueland, 1969), and Search and Teach (Hagin et al, 1976; Silver & Hagin, 1975, 1976). A detailed content analysis done by Beecher and Goldfluss (1978) of ten kindergarten scanning and screening tests may be found in Benton and Pearl.

In their efforts to understand the diverse symptoms presented by children with reading disabilities, Silver and Hagin in their research have attempted to unify symptoms as all related to orientation in space and organization in time. This means that immaturities may appear in the visual discrimination and recall of asymmetric figures, in specific spatial distortions, in visual motor function, in temporal sequencing of auditory stimuli, and in the orientation of the body and space as seen in finger gnosis,[7] praxis,[8] and right-left discrimination, and in those postural responses relating to orientation in space. The perceptual defects seen, regardless of modality, have a common denominator: spatial and temporal organization.

With this theoretical base and with data obtained from intensive evaluation over two successive years of all children in the first grade of a school on the east side of Manhattan, a test battery of ten sub-tests was constructed. These sub-tests include visual perception, auditory perception, body image and intermodal factors. Administered in the kindergarten year, Search is an individual test which is designed to predict which children will fail and which children will succeed in reading by the end of their second grade.

So far, we have seen that early identification of children at risk for handicapping conditions may be suspected as a result of prenatal, perinatal and postnatal damage, of chromosomal defect, of inappropriate stimulation at critical ages for language development and of materially impoverished homes. Attempts at early intervention have given rise to model programs at the pre-kindergarten level. The majority of children with reading problems, however, may be identified at a slightly later age (five and six years) by means of a scanning test. The content of these tests vary, with the majority retaining the classical neuropsychological correlates seen in children with reading disability. These correlates may be found in all avenues of perception, language development, comprehension and use, in intermodal integration[9] and in gross and fine motor abilities. Few batteries for the prediction of potential failure have a firm theoretical base. The batteries which do include those of Satz, Jansky and DeHirsch, and Silver and Hagin.

Screening instruments, however, must have attributes additional to a theoretical base. Ideally, a scanning instrument must be able to serve a large number of children quickly and economically, and to predict with validity which child will fail and which will succeed in reading. It must ensure that the incidence of false positives is negligible and negatives minimal; that it is statistically acceptable from standardization to interpretation; and that it is appropriate for the population to be studied. Furthermore, an ideal screening procedure is one that allows for the administration of the test and the interpretation of the results to be conducted skillfully be school personnel after brief training; that is able to locate children who need more detailed and extensive diagnostic procedures; and that provides the teacher with a basis for intervention.

Again it must be stressed that scanning is not diagnosis. All scanning can do is identify those children who, with respect to their peers, perform poorly on the test given. Scanning is not intended to be an all-or-none phenomenon, a pass-fail decree. It should not, therefore, be used "negatively as evidence for withholding service, for categorizing, for non-promotion or for non-admission to school. It is intended for positive action, to locate children in need of clinical services and educational intervention, to support and supplement classroom instruction" (Silver & Hagin, 1976, p. ix). Scanning thus becomes the first step in a program for the prevention of reading problems, enlisting support and involvement from parents, teachers and school administrators.

FALSE POSITIVES AND FALSE NEGATIVES

Certain of the attributes of the ideal scanning instrument need amplification. The importance of negligible false positives and minimal false negatives is emphasized. In daily practice within the schools, the incidence of false negatives (that is, the test says "will succeed" but the child does not succeed) is not difficult to ascertain. As has been stressed in this paper, so varied are the causes and the symptoms of reading failure that we could hardly expect a rapid scanning instrument to identify all children who will fail. Empirically, we may place an acceptable incidence of false negatives at about ten percent of all children scanned.

False positives, on the other hand, are potentially more serious and more difficult to determine. Here the test says "will fail", and the child does not fail. To determine the validity of this prediction, specific intervention procedures which could be introduced in the preventive program must be withheld, and the child permitted only regular classroom instruction. Paradoxically, an effective intervention will prevent the vulnerable child from failing and so will increase the percentage of false positives. On the other hand, to withhold remediation within a school that has a preventive program is a difficult task. One way or another, teachers will insist that their child receives special help. Fortuitous circumstances, however, sometimes do permit control groups of vulnerable children and some studies are specifically designed only for the predictive aspect of the program in which preventive intervention is not part of the experiment. Where control studies are done, we estimate as permissible a false positive in the one percent to three percent range.

To cite these percentages, however, may be misleading. To understand their significance one needs to know how vulnerability is determined in the particular scanning test. A higher cut-off point means that more children will be considered vulnerable to reading failure and, conversely, that there will be fewer false negatives. A lower cut-off point will mean fewer false positives but greater false negatives. Our experience has suggested that the cut-off point be determined by the actual prevalence of reading retardation within the particular school system. If, as we have found out, one-third of the fifth grade in a school district is functioning below expectancy in reading, we set the cut-off point at the lowest one-third of the distribution of scores in each sub-test of the scanning battery. This manoeuvre suggests that in each school we are dealing with a continuum of functions, that there is no absolute pass or fail but a distribution of skills along a normal curve. Diagnostic labelling is thus avoided and the scanning instrument becomes appropriate for the school population studied.

There is one other factor important in determining "hit rates" and false positives and negatives, and that is the criterion used to measure reading success and failure. Satz et al (1978) use teacher ratings on a word recognition test, whereas Keogh and Becker (1973) suggest that "other measures than teacher ratings are needed to monitor aspects of children's performance and competence" (p. 11). Guidelines for the use of achievement tests as criterion measures are discussed in Farr (1969) and in the U.S. H.E.W.'s *A Practical Guide to Measuring Project Impact on Student Achievement* (1975). Our own preference is to use a test of oral reading word identification, letter identification and word attack sections of a reading mastery test at the end of first grade, and a comprehensive mastery test at the end of second grade.

Not only are the criterion tests important, but so is the level of the competence used. Do we use national norms, grade expectancy scores, median scores for the class? Each criterion will yield different results so that the reporting of false positives and false negatives will depend in part on the statistical manipulation. Obviously, each test and the criterion used must carefully be considered and documented in evaluation reports.

TESTING AND THE READING PROCESS

Even when the content of the early identification battery has been decided and statistical constraints satisfied, we must ask if the tests contribute to our understanding of the nature of the reading process. It appears hazardous to interpret the tests in neuropsychological terms. For example, the Metropolitan Reading Test (Hildreth et al, 1965), used by one-third of ninety-three school districts sampled by Maitland et al (1974), consists of six sections in which the child records his or her responses by circling the correct answer on a record blank. In the first section, called "word meaning", the examiner names an object which the child must circle in a three picture array. Is this really "word meaning"? Is it a test of auditory discrimination, of picture recognition, of figure-background perception, or of attention?

Other sections are more complex. For example, many scanning batteries use a visual-motor test. Is this a test of visual perception, of visual-motor association, of fine motor coordination, or of praxis? It is clear that the name which the authors apply to a given sub-test does not reveal the underlying neuropsychological mechanisms. The functions studied may not be discrete functions at all, but, in fact, segments of the same basic function. Certainly the relationship between a test and a specific neurological function must be viewed with caution.

Most tests do not pretend to add to knowledge of the reading process. Those with a very definite theoretical posture and experimental design, however, have in my opinion supported the contention that beginning reading requires an intact perceptual apparatus. Conversely, where specific immaturities are present, word discrimination will be difficult. My own bias, of course, sees the specific perceptual immaturities as those relating to orientation in space and organization in time. From a practical point of view, however, readiness tests administered at the beginning of first grade do have a modest relationship with first grade reading. As well, the scanning instruments given in the kindergarten year do have modest predictive value.[10]

With few exceptions, hard data with respect to standardization, population studied, reliability and validity are not available for most screening tests. Satz (1978) has repeatedly pointed out the weakness of most studies, not only for their statistical lacunae but also for their lack of longitudinal follow-up and cross-validation. In spite of these limitations, the prevention of reading disability is a vital issue and scanning in the kindergarten grade to identify children who have potential for reading failure is becoming an accepted procedure.

DIAGNOSIS AND INTERVENTION

As repeatedly emphasized, however, scanning is only the first stage of a program for the secondary prevention of reading problems. Diagnosis and intervention are the remaining components of such a program. By diagnosis we mean the individual examination of the child, to determine if possible the cause of the findings revealed by the scanning instrument, to evaluate his or her physical (including neurological), psychiatric, psychological, social and educational status, and the influence of each of these components on his or her capacity to learn. Because diagnosis is expensive, and professional time scarce, complete diagnosis is reserved for those children vulnerable to learning failure who may score at the lowest end of the scanning battery or for those who are not responsive to intervention. For the majority of vulnerable children, educational intervention alone will be sufficient. In our experience, approximately twenty-five percent of the entire kindergarten class has the perceptual and neurological immaturities we have come to associate with reading failure. Two-thirds of this twenty-five percent group may immediately be placed in educational intervention. For the remaining one-third, educational intervention is also needed but it may not be sufficient. These children may require paediatric, neurological, psychiatric or psychological help for a complete program.

In this paper I have focused on the identification in the kindergarten grade of children vulnerable to reading failure, at an age level which is not too late for secondary prevention. I have mentioned only briefly attempts at primary prevention, with the reduction of the adverse impact of prenatal, perinatal and neonatal defect, and of the effects of inappropriate stimulation at critical ages for perceptual and language development. There exist, of course, many attempts at identifying developmental disabilities in the pre-nursery ages. These attempts have arisen in large measure from the impetus of the Early Periodic Screening Diagnosis and Treatment Program (E.P.S.D.T.) mandated by the U.S. Public Law 90-248 (1967), which requires that all American states participating in the Medicaid program[11] provide E.P.S.D.T. services for all persons under twenty-one years of age eligible for Medicaid. These screening devices, many a combination of paediatric neurological examination, psychological testing, and the Gesell Developmental Schedules (1947) have been described by Meier (1976, a,b), Thorpe and Werner (1974), and by Hersch and Rojcewicz (1974), and will not be reviewed here.

It should be noted, however, that these screening devices suffer from the same limitations as do the kindergarten scanning tests. In addition, because they attempt to find a much broader range of developmental problems, the tests have increasing difficulty with validity and reliability, and most seriously, do not yet have a strong intervention component. They really are trying to do too much for too many with too little. It has been said, however, that E.P.S.D.T. "promises to be a giant step in developing and improving child rearing" (Rojcewicz & Aaronson, 1976, p. 303). Certainly the development of programs to prevent reading failure can be an equally giant step forward in education.

SUMMARY

The primary prevention of reading failure, through the eradication of the causes of reading failure, involves broad social and educational change, and modification in prenatal care and obstetrical routines. These changes are gradually being made. More immediate are programs of secondary prevention, where, although the cause is not removed, the adverse effect of immaturities can be prevented and the symptom of reading failure need not occur. Such projects involve early identification, scanning in the kindergarten years, diagnosis of children found vulnerable to failure, and intervention to correct the immaturities revealed.

The content of scanning instruments has been based upon findings of neuropsychological correlates of reading failure, as determined by experience of educators and neuropsychologists, and by theoretical constraints of the skills needed for reading. The content, therefore, may run the gamut to include visual perception, auditory perception, intersensory integration, language ability, or symbolic mediation of stimuli. Few scanning instruments meet accepted statistical constraints of standardization, reliability, or validity, and fewer have long term longitudinal study and cross-validation. The criteria for validation must be considered carefully: the cut-off point in the scanning instrument, the criterion tests used to determine reading level, and the level of achievement relative to the child's peers.

It is recommended that to avoid the labeling of pass and fail and to have the test appropriately reflect the population of the school studied, cut-off points should be based on the actual prevalence of reading failure in the individual school or individual school district. Although the neuropsychological process underlying the items of test batteries may be obscure, these tests do have a modest relationship with reading tested in the first, second, third and fourth grades. The relationship should be such that false positives are negligible, and false negatives minimal. Ideally, too, the scanning battery should identify those children who need further diagnostic study and should also provide a basis for educational intervention. Lastly, scanning is not diagnosis. It should not be used for categorizing, nor as evidence for withholding services or non-promotion. Scanning is intended for positive action, locating children who need educational services to support their classroom instruction.

NOTES

[1] The O.E. funds research projects in preschool education. Their address is U.S. Office of Education, Bureau for the Education of the Handicapped, Early Education Projects, 400 Maryland Avenue S.W., Washington, D. C. 20202.

[2] Dysgnosias are difficulties in perceptual recognition, as evidenced, for example, by visual reversal of letters. Dyspraxias are difficulties in the imitation of fine motor patterned movements such as writing. Dysphasias refer to language difficulties in the receptive, associative or emissive functions of the central nervous system.

[3] Finger localization is a specific example of finger gnosis, explained below (see note 7).

[4] The ABC Inventory is an individual test for children aged four to six years, and includes items related to drawing, copying, folding, counting, memory, general information, colours, and size concepts.

[5] The Eliot-Pearson Screening Profile is intended for children aged four-and-a-half to five-and-a-half years, and surveys perceptual, motor and language development.

[6] The Meeting Street School Screening Test has as its theoretical base the psycholinguistic processing model of Osgoode and Marion (1963). It examines not only visual-perceptive motor skills, but also language functions and gross and fine motor skills.

[7] Finger gnosis is a specific example of gnostic ability, related to the concept of the fingers in space. It is clinically tested by the examiner lightly touching finger tips (dorsal aspect) and the subject, eyes closed, identifying the finger or combination of fingers touched. This assumes that sensory ability is intact, and that the problem lies in the central representation of the fingers.

[8] Praxis, a central nervous system process, refers to the ability to imitate fine movements with intact motor co-ordination.

[9] Intermodal integration is the ability to relate the perceptual input via one modality with the expression of that input via another modality, e.g., visual-motor, auditory-visual-motor.

[10] The Meeting Street School Screening Test correlates .63 with reading achievement at the end of first grade. The Jansky-DeHirsch Screening Index identified seventy-five percent of the children who failed in reading at the end of the second grade. Satz reports correct prediction in the seventy-five percent range at the end of the first and second grades, but fifty-seven percent in the fifth grade. In terms of false positives, Satz finds seventeen percent at the end of grade three and 4.6 percent at the end of grade five. Silver and Hagin report Search's prediction capability of one percent false positives and ten percent false negatives at the end of the second, third and fourth grades.

[11] Medicaid is an American program of financial support for medically related care, for those who fall below federal standards for minimum income.

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THE RISK OF NORMALITY

Dr. Raymond Sumner

INTRODUCTION

In selecting the focus and title of this paper, I was influenced by the breadth of definition adopted by a recent United Kingdom Committee of Inquiry into "Special Educational Needs" (Warnock, 1978), by the lack of accepted practice, and by the diffuse nature of the concepts apparently relevant to a consideration of this area of activity. Dr. Shipman's finding that, for the children in her particular groups, no overriding patterns of variables were associated with the incidence of learning difficulty, seems to reinforce the direction I have followed. This paper pursues the notion that understanding the child and understanding the curriculum are both necessary prerequisites to understanding the ways in which an individual may be brought to learn. Such an approach concurs with Dr. Shipman's rejection of the deficit model. It may also provide a clue to the dynamic interactions she postulated as occurring between those pupils whose progress was extraordinary and their teachers.

Dr. Shipman's context was firmly placed in the "Head Start" programme and its follow-up studies. I did not have such a specific location. I was aware that discussion of "learning problems" and the prospects of "early identification and intervention" was likely to be seen by some educators as entering uncharted territory full of pitfalls for the unwary; others would view it as a field full of promise for those children not fortunate enough to thrive in the environment--at school and at home--in which circumstance has chanced to place them.

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CONTEXTS

In talking to a number of teachers, advisors and psychologists as to their opinions on the topic, I found that two main viewpoints were taken. These were, either to think of *children* in difficulties, or to consider *problems* which commonly restrict learning progress. Neither context is entirely separable from the other, though the underlying assumptions may be. In the first context (which may be called child centred), the unstated premise was that certain children will find early learning difficult and will continue to aggregate further problems unless the process of accumulation is deliberately halted. Those choosing the problem context spoke of a particular aspect of the curriculum producing a crop of learning problems as it is introduced to children; without careful attention, it was said, these will persist and obstruct the course of future learning.

It would be facile and misleading to label some members of my haphazard sample "child centred" and the remainder as "syllabus centred". Their reactions, whilst contrasted in some degree, include the range of possibilities described in the recently published report on special educational needs (Warnock, op. cit). Here, the concept of special education was deliberately widened in the rejection of previous distinctions of "the handicapped" and the "non-handicapped". The Committee thought that although the majority of children may experience educational problems from time to time, as many as a fifth of the children in the school population might have need of special educational provisions at some time during their school careers. To most of the people I spoke to, this proportion was startling, and its implications aroused dismay and some resentment.

Both contexts exist side by side. It seems important to analyze both in some depth in an attempt to strengthen our procedures and, perhaps, to increase the possibilities of ameliorating children's learning problems. If the emphasis is placed on children, "early identification" could begin before mandatory schooling, in the home, day nursery, nursery school, preschool play group or clinic. After the start of compulsory school attendance, in the United Kingdom at the age of four, children experiencing marked learning problems could be identified in the infant or first school, up to the age of eight. But if the problems of learning are stressed, identification can occur at any stage. The important feature is perceiving, early in a learning activity, signs that a pupil's difficulties are likely to be exceptional.

EXPECTATIONS

Either context embodies a view of the curriculum and of constructs about children's maturation, and a view of their patterns of growth, language development, interpersonal transactions, cultural influences, emotional control and evolving intellects. In the early years, the most fundamental learning challenge is the supplementation of verbal language by the written form; thus communication of ideas is no longer dependent upon the transient events of spoken language. Similarly, the "experienced environment" is translated into images--as both pictorial representations and as abstract two-dimensional figures. To these ends, classrooms and nurseries pulse with activity, with pauses for milk, story and meals. The beginnings for a formally structured curriculum emerge when a school adopts one or other published programme or scheme for reading or mathematics.

Consequently, although there are general norms in various guises (e.g., developmental charts, reading ages, published programmes), there is little consensus as to those specific learning experiences of particular benefit to younger children. At a somewhat later stage, careful evaluation of highly specified strategies and materials, such as the Initial Teaching Alphabet,[1] have been largely ignored. Our conception of the curriculum in the nursery and infant years is diffuse. Only recently, in the United Kingdom, is a renewed emphasis on cognitive outcomes giving a better sense of direction to much of the teaching done with young children.

In these uncertain contexts, what constitutes a learning problem? If we take the stance that anyone learning anything at all presents a learning problem, it becomes obvious that we are concerned with those occasions when a child finds the problem inordinately difficult or intractable. The great majority of children "solve" innumerable learning problems with ease, frequently without overt teaching. For instance, how many of us can remember being *taught* to scan horizontal displays of printed characters or to interpret all the common typefaces as representations of the twenty-six letters of the alphabet? "Difficulty" is a normative concept, as is matching learning tasks with "levels of ability" or "stages in development". In many respects, therefore, the pace at which new topics or skills are introduced into the curriculum is aligned with the notion of capability. What children are expected to learn should not be too difficult!

The teacher, therefore, ought to have a good knowledge of the learner; what s/he already knows and can do; what s/he understands and can explain; what s/he can do with help; what skills have been habituated. This inventory will, I suggest, be remarkably precise over the range of activity within the teacher's purview. Given a new learning situation, however, the teacher's forecast of attainment will be disproved in a number of cases. Some children may learn with unexpected ease, others will find surprising difficulties. My surmise is that the problems arise from the nature of the new information.

Very rarely is it possible to attempt to match each learning task to every individual. Nor do teachers, or many other educators, have the necessary analytical skills to do more than give a cursory examination to what is to be learned. For example, only recently have reading level analyses shown that many school texts are pitched well above the reading capabilities of the pupils for whom they were written. When it occurs, therefore, retardation, whilst relative to peers, is also relative to "knowledge".

A range of inhibiting factors might apply to children whatever their intellectual makeup. The mental development of some children may even be suppressed through lack of stimulation; hence, cultural activity in the home and family consistently demonstrates positive associations with scholastic attainment. Others are more internal to the child. To quote a recent publication, "He may *equally*--be a non-reader or a very slow reader--have severe difficulty in writing and spelling--need remedial provision in school--be difficult, moody, unpopular, and indifferent to work--have very difficult parents". It is interesting to note that this quotation is from a paper entitled *Find the Gifted Child* (Owen, 1977). The list above follows a longer one of optimistic characteristics; but it is salutary to find that some symptoms can apply to gifted and slow learners alike. It shows, too, how misleading a superficial, stereotyped identification could be.

IDENTIFICATION

In either the child centred or the learning problem context, identification is essentially a process of analysis. In the former context the question is whether or not a child is relatively retarded. The answer must depend on the choice of criteria considered appropriate. Here I see no alternative to adopting normative standards. It will not do to declare that the child should be judged only by performance at a certain task (i.e., criterion-referenced testing). For example, adding 7 to 19 may be precocious at one age, but indicative of retardation at another. Any criteria must contain the idea of maturity in relation to knowledge learned. In the latter context, concerned with the early identification of learning problems, the criteria are specific to whatever learning is underway or likely to be attempted. In this case, criterion-referenced tests could be used to judge what constitutes a problem. It should be noted that such tests of profiency will not explain *why* a child is finding an aspect of knowledge difficult to learn; hence, we must be wary of accepting "diagnostic tests" at face value. It is my belief that before any tests are administered, the gains over and above observation and a teacher's experience should be estimated; common sense will go a long way.

Little in the foregoing is new. The problems of identification are mainly operational. Examples are: What is an appropriate curriculum? How do one teacher's perceptions compare with another's? Should a school in one type of social setting apply the same criteria as schools in other environments? Ought special disabilities be taken account of or allowed for? What aspects of development should be encouraged to emerge before others? Is it wise to bother about children manifesting generally slower maturation--will nature not take its course and bring about a late spurt, as does happen?

Faced with these uncertainties, those responsible for decision making must find a set of criteria as best they can. It is hardly surprising that diversity abounds. In England and Wales, three major types of practice have emerged.

1. The most well established is the Local Educational Authority (L.E.A.)[2] annual survey usually of reading at ages from seven to thirteen, with ages eight and nine most common. Sometimes, a second test, of verbal or of non-verbal reasoning is given at the same time; "potential" versus "actual" comparisons can be made for each child and for the L.E.A. The Department of Education and Science (D.E.S.) report of an enquiry into language learning (Bullock, 1975) illustrated that criteria for identification varied markedly on a standardised scale ranging from 60 to 140. With 100 corresponding to average performance, criterial scores as low as 80 and as high as 98 were utilised, with 80, 85 or 90 being most common. The tests, too, differed greatly in that some were chosen to "spread out" the slow readers; others were balanced about the average for the age group concerned.

2. With younger children, for whom group tests are unsuitable, teachers' observations of attainment are obtained and recorded on checklists. Some of these devices are augmented by tasks performed by the children, occasionally in small groups, as, for example, the Humberside Infant Screening Procedure,[3] but usually in one-to-one situations, as, for example, the Bury Infant Learning Check.[4] These devices are produced by psychologists for teacher administration--unlike the specialist instruments, such as the

Illinois Test of Psycholinguistic Abilities (I.T.P.A.),[5] the McCarthy Scales,[6] the British Ability Scales,[7] the W.I.S.C.,[8] and so on, for use only by qualified psychologists. The results from checklists are never, to my knowledge, treated as survey data. They are used to inform the teacher or to enlist the help of specialists.

3. The concept of "at risk" gained credence throughout the early sixties, hence, attempts were made to devise methods for identifying children who *might* experience learning problems because of unpropitious family or environmental circumstances or because their personal attributes were unpromising. Here the intention is to anticipate the likely emergence of severe learning problems by utilizing data probabilistically. Factors shown by research studies to be associated with relatively poor attainment enter the prediction, including social class status, financial stringency, parental attitude and education, ethnic origin, distractibility, tension and other personality and motivational traits.

A curious omission--except in the Swansea Evaluation Profile[9]--was the validation of the predictive power of current school attainment. This collection of measures of ability, teachers' observations and behaviour checks (by Rutter, 1967) is exceptional, too, in that its validity was studied over a follow-up period of almost two years. Teachers administer tests and record observations towards the middle of the first infant term (that is, when children are between 4.11 and 5.04 years). The objective is to identify entrants to infant school in need of compensatory education. The procedure yields a composite score with a cut-off point below which children are deemed to be "at risk". Additionally, children can be identified as having characteristics typical of those who make normal progress, or as belonging to one of four groups who are unlikely to do so.

In the Swansea development project (Evans et al, 1978), the data analyses allocated 219 of the 627 children (or thirty-five percent) into one of four groups, as follows:

1. Ninety-five children (fifteen percent) whose teachers forecast learning difficulties and who performed badly at a symbols test simulating reading; their families were living in financial stringency.

2. Thirty-eight children (six percent) who had adequate perceptual and language skills despite poor performance on the symbols test; they lived in run-down neighbourhoods and their fathers had left school by age fourteen.

3. Seventeen children (three percent) whose teachers forecast good progress; their symbols test results were average, but they did badly at the numeracy tests.

4. Sixty-nine children (eleven percent) with good scores on the symbols test, but adjustment problems indicated by the Rutter questions, and teachers forecasting only average or poor progress; they lived in average neighbourhoods.

Multiple regression analyses[10] demonstrated that eight of the predictor variables combined more effectively than other groupings. These were: (i) numeracy test; (ii) English Picture Vocabulary Test; (iii) symbols test; (iv) visual perception test; (v) teachers' estimate of future progress; (vi) deprived school area; (vii) term of entry; and (viii) size of family. From this analysis, 108 children (seventeen percent), when assessed at age five, were classified as "at risk"; sixty percent of these pupils were found in the lowest band of the whole sample (i.e., the 20% with lowest scores) when attainments were assessed at age seven.

The scope of the Swansea enquiry, the data gathered and the analyses performed are impressive. Nevertheless, overall effectiveness deserves consideration. The tests are time consuming as most are individually administered. The teachers' forecasts are based on observation over the initial two month period in the school. This latter variable contributes a substantial element to the "at risk" predictions, although other variables as noted above augment the forecasts. Nevertheless, about forty percent of the pupils comprising the lower attainment band were not identified by the predictions.

It would seem that attempting to identify children currently or potentially "at risk" promises many hazards. Imagine that three kinds of information can be gathered systematically and criteria applied to each, signalling "at risk" or "no risk". One indicator might summarize home background information, another might deal with learning skills and attainment, the third might take account of temperament.

We must grasp the nettle: criteria define decision points; hence, each indicator variable produces a "go" or "no go" situation. Our summary chart might read as follows:

Intellectual capability		Enter 0 or 1, according
Disposition		to the classification derived from the
Circumstances		relevant assessments.

Assuming that each variable is independent of the others--the best circumstance for profile interpretation--the range of possibilities for classification is as follows:

CLASSIFICATIONS AS

	NORMAL	PROBABLY HANDICAPPED							PERCENT OF INCIDENCE
Intellect	1	1	1	0	1	0	0	0	20%
Disposition	1	1	0	1	0	1	0	0	10%
Circumstances	1	0	1	1	0	0	1	0	20%
	58%	14%	6%	14%	2%	4%	2%	½%	
	A	B	C	D	E	F	G	H	

The percentages are imaginary but they illustrate a number of points. With twenty percent of children classified as intellectually weak, ten percent as temperamentally unsuited to school or study, and twenty percent experiencing limiting environments--not improbable figures in some districts--the distribution of "normal" and "handicapped" pupils would be as shown. (Note that if one condition caused or was correlated with others these distributions would be changed.) Thus, the groups identified would be:

A	58%	No predictions of learning problems.
B	14%	Inhibiting circumstances, otherwise willing and capable.
C	6%	Temperamental difficulties, capable intellectually with a helpful environment.
D	14%	Willing to work, supported at home, but intellectually weak.
E	2%	Lacks support, temperamentally weak, bright enough to cope.
F	4%	Willing to try, lacks support and is intellectually weak.
G	2%	Well supported at home but dispositionally and intellectually weak.
H	½%	Poor prospects on all counts.

Pursuing this figment a little further, we can see the implications for intervention are quite plain. Those temperamentally at risk (categories C, E, G, and H) would be in need of behaviour therapy; the intellectually weak would require diagnosis and specific remediation (categories D, F, G, and H); those in poor circumstances would require compensatory environments (categories B, E, F, and H). Removing therapy from the teachers' ambit, but expecting them to tackle remedial learning and to compensate--as best they can--for limited circumstances (school holidays, outings, residential schools, books for home reading, etc.) would leave almost ninety percent of the children in normal schools. Of these, about a third would be affected by one or two types of handicap.

So where are the snags? Multiple classification procedures are far from being free of errors--just the reverse. The literature on multiple regression techniques stresses the necessity for cross validation (see, for example, Tatsuoka, 1969, for a readable exposition) before any reliance is placed on the predictions. Also, differences between profile elements are relatively more prone to error than either of the pairs of elements compared (see, for example, Cronbach, 1970). In my fictitious example, a youngster given the "benefit of the doubt" on each of the three aspects assessed could be allocated to the fifty-eight percent with no problems instead of the one half of one percent suffering multiple handicaps! And, in the real world, children and circumstances may change often without any dramatic external signs to mark a transition.

In practical terms, recognizing that erroneous classifications *either way* may be made entails carrying out unprejudiced checks on a broad band of children for whom classification was at all problematic. It seems axiomatic, too, that "intervention" based on an "at risk" prognosis will be more tentative and less capable of validation than information founded on demonstrable learning difficulty.

At recent estimates, almost two thirds of the L.E.A.'s in England and Wales carry out screening or monitoring programmes. With younger groups the aim is to signal the advent of difficulties, whereas with the older children, those in difficulty manifest relatively poor attainment in reading or mathematics. Presently there is no evidence available to enable comparison of the utility of either procedure or to estimate the effectiveness of one or the other. This seems to parallel the situation in Canada.

The most recent national survey of reading in 1976-77 (D.E.S., 1978) carried out with the same standardized test previously used in 1970 (and 1960 and 1955) showed that eleven year olds have advanced to a new peak. Schools in suburban localities had made the greatest progress, rural schools came next, with urban schools last. Against this background, it is difficult to evaluate a report from one area (at a conference on "Identification of Children with Special Educational Needs" edited by Purushothaman, 1977) attributing reductions in the percentage of children aged eleven with reading ages below nine years to the effects of early identification and help. Here was someone saying, "It's because we're doing our early identification that our reading standards have gone up". But there was no comparison with the total situation, which would have indicated that the reading standards had risen everywhere. Other L.E.A.'s not screening at an early stage could make similar claims for other procedures, for example, remedial teaching at special centres.

Clearly, there is a need for a series of searching studies in the area of identification, either of children in general difficulty or experiencing specific problems. The first requirement would be to examine the essential qualities of any instrument used. Firstly, their reliability: whether the measures obtained vary only because of child changes or because of other circumstances, such as change of user, of occasion, of location or of social context. Secondly, their validity should be investigated either as identifying agents, in the case of children, or as diagnostic indicators locating specific learning problems. The veracity of the identifying procedures is a first requirement for going beyond Woodhead's (1976) conclusion that "disadvantage" resides in individuals rather than schools, a challenge to the belief that all children in deprived areas will be disadvantaged educationally.

The number of children likely to be singled out will vary according to the identification procedures used, their accuracy (important for avoiding false positives or missing true negatives), and the criteria chosen. Some indication of incidence can be seen in a recent survey of literature (Cave & Maddison, 1978) which offers the following examples: twenty to thirty percent of "children who give cause for concern" (Wall, 1973); infants from a good residential area, of whom sixteen percent are in need of some additional help (Webb, 1967); in France, twelve to fifteen percent of children in nursery education unable to start primary school (Blackstone, 1971), and so on.

Within these bands lie the children with well defined physical or mental handicaps, although as the Warnock Report (op. cit.) emphasized, the educational needs of these children might not be exceptional. Consequently, the chances are that an urban teacher in a school where streaming or other grouping methods are not practiced is likely to have between six and ten children with general or specific problems, some difficulties persisting and others only temporary. This, it should be emphasized, is the normal and not exceptional situation for urban teachers.

Bearing in mind that both systems and problems will be varied in degree and kind, and that many other children in the class will not find learning easy, we must view dealing with learning difficulties as "normal". Only when learning is attempted can "identification" occur (by analogy, the "slow runners" show up when they run, not when walking or sitting down). Consequently, I am led to conclude that the most effective indication is the product of teaching; and furthermore, that it is continuous and contiguous with "intervention".

INTERVENTION

Whenever learning attempts are frustrated or partial, the teacher (someone who is teaching in the fullest sense of the term) seeks explanations and fresh approaches. Teachers of this calibre have had no time for the well-known Coleman et al (1966) or Jencks et al (1972) conclusions that schools hardly affect standards of achievement. Teachers can find encouragement, should they feel the need of any, in two secondary school studies which attribute a great deal to the practices of schools (Brimer et al, 1978; Rutter et al, 1979). The latter enquiry identifies a number of factors associated with relatively high attainment. Certain of these seem germane to me, although teachers of young children may question whether they are appropriate. The abbreviated list is as follows: good classroom management, lesson preparation, high expectations about work and behaviour, the model provided by the teacher, feedback to the children as to what is regarded as acceptable attainment, consistency of values, pupils' acceptance of responsibility, low rate of pupil absenteeism, the regular setting and marking of homework, and an ethos engendering confidence. (The teachers' principal union was not impressed by the originality of these findings.)

This argument leads towards equipping teachers not only with "teaching skills", but with insights into learning and its attendant problems. This know-how will extend to the use of specialized techniques and the involvement of other specialists, as needed. A move in this direction has been made by the Calderdale L.E.A. (Monaghan, in Purushothaman, op. cit.) which has provided teachers with a "service delivery system to the child in need". This allows the teacher to proceed on his or her own initiative or to involve other agencies after s/he has carried out assessments of communication skills, behaviour, perception and numeracy. Similarly, in the context of screening, the Humberside L.E.A. (Randall et al, 1978) has developed checklists and tests for assessments accompanied by guidance toward possible teaching strategies.

Devising and producing materials for assessment is a specialist job, either in respect of the theoretical rationale or to fulfil the technical requirements of demonstrating reliability and validity. For example, the National Foundation for Educational Research (N.F.E.R.) project to develop "Assessments in Nursery Education" (Bate & Smith, with Sumner & Sexton, 1978)[11] took two project officers three years, throughout which specialist advice from test constructors, statisticians and teachers was available and fully utilized.

There is no lack of assessment devices, although their quality is uneven (Bate & Smith, 1976) and range of content extensive. Also, a wealth of materials for assisting learning has been created, much of it attractively and thoughtfully designed for a specific purpose. There may possibly be a need for more of these as the complexities of learning even the more fundamental ideas and skills are appreciated--particularly if these can be linked, through identification (diagnostic) techniques, to specify types of learning difficulty, as proposed by Stott (1975). But in my view, a thoroughly unproductive line to follow would be to produce set-piece programmes of prescribed exercises.

Materials of this kind would invite teachers to become unthinking operators rather than to analyze each child's learning problems and to seek humane ways of overcoming them.

Much is already available. What, then, might be the missing components? Here the list could read:

1. An acceptance that learning problems are normal.

2. Stated policy for the school system, within the schools, and bridging the two.

3. The planning necessary to manage classroom activities so as to provide each teacher with time and space to deal with individuals' problems as they occur.

4. Systems to provide flexible access to special resources of materials and personnel.

5. Sound understanding of "learning" as such, including the complex detail uncovered by research workers and teachers alike.

Ideally, the underpinning for any learning difficulty identification and related intervention provision should be embedded in a credible theory of mental processes. We have had a large number of these each with its compelling features. I believe, however, that rather than choosing one or other school of thought it is preferable to try to integrate some features of those theories which have direct relevance to practice in schools. But in doing so, there is a danger of creating, yet again, a structure which is too complicated for practical use.

Complex as it is, Guilford's Structure of Intellect model (1956) has been largely verified, whilst its relevance to school learning has been explored and illustrated (for example, by Meeker, 1969). Around the same time that Guilford was developing his model, a framework for educational assessment was devised and organized as a taxonomy of the "cognitive domain" (Bloom, 1956). There are similarities between these two schemes even though one is hierarchical and the other is topographical. "Process" in one scheme is similar to "operations" in the other. Both deal with recognition of data (cognition) and its recall (memory), application and analysis (divergent production), selection and synthesis (convergent production), and evaluation. Guilford calls "contents" the forms in which data may be manifest (these are "figural", "symbolic", "semantic" and "behavioural"), but I would prefer to describe these as "communication modes" (action, sounds, words, numbers, symbols, pictures, objects). Again, Guilford's conceptual model considers the organization of the "products" (units, classes, relations, systems, transformations, implications).

Here in the teaching context, I would argue for classifying the knowledge *input* which must be dealt with by the learner. His or her output may be identical to the input (for example, repetition of a string of syllables demonstrating short-term memory); but for "relational understanding" to come out (Skemp, 1976), I would expect the learner to *transform* the information received. Most probably input would be expressed differently when it becomes output (for example, sorting objects by attributes transforms discrete units into sets). A further transformation may be from a concrete representation of the data to an abstract one or vice-versa (the former metamorphosis has received most attention because of its importance in children's development).

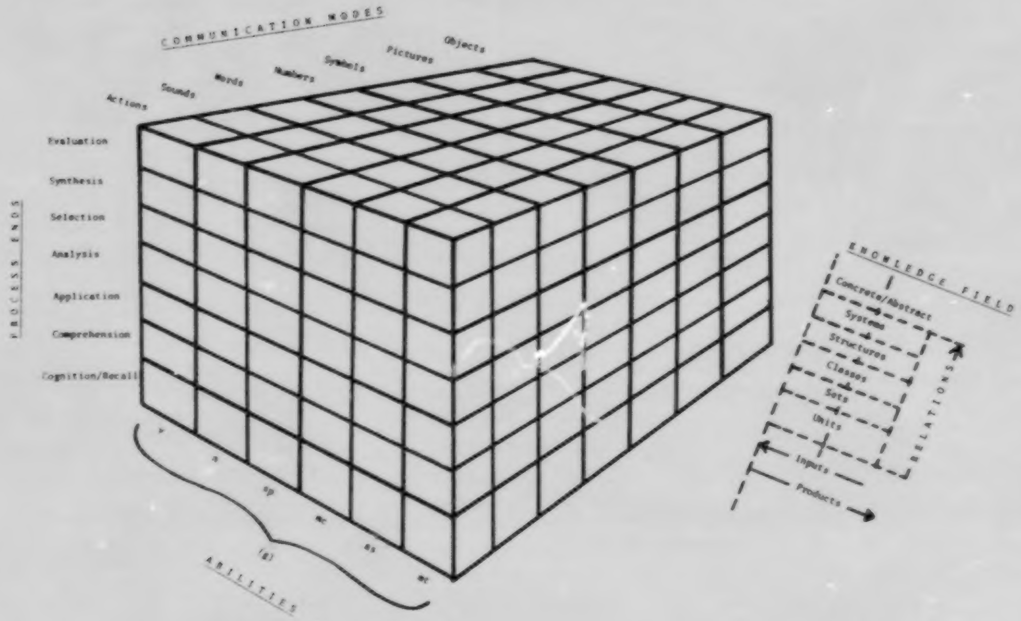
Therefore, I would argue for a structural view of the knowledge (that is, of the curriculum) as discrete elements, sets of elements, classes of elements, structures made up of elements, sets and classes, and whole systems of these; the knowledge being organized into hierarchies by relations, that is, rules for differentiating the knowledge operationally and conceptually.

Finally, there would seem to be good reasons (for example, the predictive power of these measures) to retain the historic conceptions of abilities, viewing these as constellations of operating skills habituated by individuals in respect of fairly distinctive types of information. Some of these abilities--the verbal and numerical--have been especially prominent in educational assessment on account of the consistency with which scholastic attainment has been associated with them. Others are more widely used in the vocational guidance field. There is no agreement as to the number of abilities humans possess; the Wechsler Intelligence Scale for Children, for example, has twelve subscales, whilst the British Ability Scales has twenty-four.

The diagram below shows how these four cognitive aspects of learning can be brought together in a form that is appropriate to school learning and its assessment.

LEARNING ATTAINMENT

MODEL


COMMUNICATION MODES
Actions
Sounds
Words
Numbers
Symbols
Pictures
Objects
PROCESS ENDS
Evaluation
Synthesis
Selection
Analysis
Application
Comprehension
Cognition/Recall
v
n
sp
mc
as
mc
(g)
ABILITIES
KNOWLEDGE FIELD
Concrete/Abstract
Systems
Structures
Classes
Sets
Units
Inputs
Products
RELATIONS

The internalization of "external knowledge" as meaningful and authentic knowledge to the child draws upon a range of abilities (involving perception, association, comparison, closure, imagery, deduction, inference, and so forth) to transform it for the attainment of various ends. The knowledge may be channelled to the user in one or several communication modes embodying it as concrete representation or as abstractions. The learner's task is to transform his or her initial perception of the external knowledge from one level of organization to another by operating appropriate relational functions.

The previous paragraph makes seemingly simple problems appear fearsomely complicated. "Listen to the numbers I shall say: double each one; add up these products; tell me your answer: 2, 3 . . . Answer 10." I would invite the reader to test my assertion that this little bit of problem solving can be tracked through the model from its input as words, numbers and relationships, to its output as a single word.

Probably of more importance for my theme is the fact that many of the assessments used for identification and diagnosis of learning problems fit into this scheme. For example, the Learning Ability Tests[12] (Hegarty, 1979) follow the pattern of teach ——► practice ——► test until learning is established, then teach ——► test to yield a measure. One section designed to appraise Verbal Learning utilizes units of knowledge in the form of di-syllabic names of objects. This is "concrete" input because each *object* is paired with its name in the teaching phase. The communication modes utilized are actions, sounds, words and objects, but the task of association will be located in verbal ability. The process-end signifying the completion of the learning task is "recognition". The output communicated by the child in words and sounds takes the form of di-syllabic units. For young children being assessed by someone who does not speak their own language, the cognitive level seems entirely appropriate.

Other materials, which are designed for the assessment of children's understanding of the small case alphabet during the early stages of reading, have input organized as sets of "dots and sticks" (Montgomery, 1979).[13] Various pattern recognition tasks assess comprehension of the visually perceived symbol arrangements. There are training exercises for children who do poorly on the test. These would be juxtaposed similarly if analysed in terms of the model, with learning being directed towards "comprehension" (that is, spatial closure) of the relationship between the units comprising the sets.

It would be a mistake to attach too much importance to any model, especially one of human behaviour. This one, at least, brings out the complex nature of learning activity and helps to illustrate where points of breakdown might occur. At the secondary level, for instance, Shayer (1972) argued that a new science curriculum developed with highly selected groups of pupils was too demanding of the majority of pupils because many concepts were introduced as abstractions rather than as concrete exemplars. Faced with non-cognition when the input of knowledge took place, pupils were unable to learn without vigorous supplementation by the teacher. Their progress through the course was unduly slow because of a heavy demand for abstracting from experiments performed in the laboratory.

In a mundane way, the model might be useful in analysing learning tasks or in devising learning materials. Here a good motto might be "bit by bit", one that highlights a cardinal feature of communication (that is, sequence). Fresh input displays, for example a picture, a page of print, a spoken instruction, a tune, a gymnastic movement, might be treated as bits. My guess in these instances would be that an analysis would lead to a further breakdown into "bits" when considered against the propensities of the typical learner.[14]

One convenient aspect of a model which suits both learning and assessment is that the two functions can be interchanged as required. Here, I am reminded of "conversational learning techniques" in which the learner is required to produce a satisfactory explanation of what s/he has ostensibly been learning (for example, Pask, 1976). There are similarities, too, with the use of "criterion referenced tests" in programmed learning sequences (for example, Glaser, 1963) and the stage by stage tests built into "mastery learning" (Bloom, 1971). One might see links also with the "spiral curriculum" (Bruner, 1960) in the cases where input takes place at one level of structural organization and output is at a higher, more inclusive level.

To sum up this section, it would seem to me that intervention is concerned with enhancing learning. Particular tests can have a part in its initiation, but the major job is to present learning problems in a format and state accessible to the child. Learning theories could act as clarifying agents or even as aids to the design of tasks and materials.

CONCLUSIONS

1. For pupils not physically or neurologically disabled, the normal classroom and ordinary teacher must form the stable platform for tackling learning problems of many kinds and at any time.

2. Identification should focus on the intellect-knowledge interaction so as to define and clarify the learning problem.

3. Screening for "at risk" can anticipate a proportion of children likely to meet learning difficulties, *but* reliabilities and validities of procedures are uncertain and profile differences can be deceptive. The costs in teacher effort, specialist support and resource materials of including a high number of false "at risk" identifications could be disproportionately high. Also, for a child so identified who then makes reasonable progress, there is a danger that specific learning difficulties will be masked. Conversely, failure to identify children truly "at risk" could lead to the consolidation of learning deficits.

4. L.E.A.'s "standards and resource allocation" surveys can serve useful purposes, but they are periodic, not ongoing, are fairly crude and deal with outcomes, not inputs or processes.

5. Assessment instruments can organize and complement teachers' observations--but these need sound experience as a base. Observations alone are not sufficient as they are far too bound by every teacher's background and judgments.

6. Generally speaking, teachers have a sufficient body of skills; these need organizing by reference to theory, which in turn can also inform the structuring of subject matter for presentation to the learner in trouble.

7. Teachers will have to devise ways for managing time and space so that "intervention" on behalf of the few can take place without undue constraints on the remainder. Therefore, in-service work should deal with planning, organizing, co-ordinating, and resourcing; exemplars and methods are needed rather than exhortation (see, for example, Vaughan, 1978).

8. "Screening" by administering measures of current attainment can indicate relative retardation; such assessments could provoke further enquiry but of themselves are likely to supply significant diagnostic information about any one child only occasionally.

9. Specialists can have an important role--in devising instruments for assessment, analyzing the curriculum (that is, the knowledge fields), illuminating the transformation to be performed by the learner, and in developing materials and strategies for teachers to use adaptively. One the basis of these activities--each properly evaluated--they could advise and even intervene.

10. An important effect of moving along these lines should be a gain in the effectiveness of learning across the spectra of children and curricula.

11. Each school *system* (that is, school district) should embody standard procedures for classroom, school and systems management, with some attention given to school evaluation. But for the learner, the emphasis would be on a summary record of attainments and persisting difficulties, with transmission of the right kind of information to assist with continuity of learning across transition points.

CONCLUDING REMARKS

Nothing in the body of this paper contradicts Dr. Shipman's main points, especially those stressing the essential role of good teaching, the importance of long-term effort on behalf of the child, the inadequacy of a single assessment and cut-off score, the value of parental involvement in processes related to learning, the relevance of knowing about a child's "growing environment", and the rejection of determinism when making predictions about children. Where I touched on certain of these issues, my comments tended to be sceptical rather than optimistic.

My perspective was complementary to Dr. Shipman. Whereas she has tended to focus on the child and the circumstances of its schooling, I have chosen to stress the interaction between the learner and the material to be learned, paying particular attention to the structural features of the knowledge/task. Consequently, the distinction between identification and intervention cannot be made. It is replaced by the idea of match/mismatch between the learner's intellectual resources and the elements of the knowledge to be transmitted, received and transformed during the learning process. Hence, my inference is that child appraisal skills (data from classwork, checklists, tests, parental interviews) should be augmented by curriculum analysis skills to enable appropriate learning tasks to be presented to children evincing difficulties.

NOTES

[1] I.T.A., as it is known, was developed to eliminate the ambiguities of letter to sound correspondence which may confuse the naive learner. Only lower case letters are used and the full range of vowel sounds is covered with corresponding letter combinations. Children convert, readily it is said, to traditional orthography after one or two years of using the I.T.A. materials.

[2] There are one hundred and four L.E.A.'s in England and Wales with responsibilities similar to those of school boards in Ontario. The Department of Education (cf. the Ministry) has responsibility for ensuring that each L.E.A. provides a satisfactory form of education. It does not specify that overall testing of children should be conducted. There are, however, national surveys done on a sampling basis.

In the United Kingdom, the educational decisions largely repose in the schools and very largely in the classroom; no syllabus or programme is dictated by an L.E.A. The schools and individual teachers decide which books to buy, how to sequence the work, and what curriculum materials they wish to introduce and emphasize.

[3] The Humberside Infant Screening materials (Randall et al, 1978) are designed for two age groups of infant school children, that is, for the five and six year olds. The former are assessed by teachers' observations as recorded on checklists, whilst the latter utilize a number of short tests which can be given by teachers to small groups of children. A feature of these materials is their basis on the rationale for the I.T.P.A. described below.

[4] The Bury Early Infant Learning Check (Pearson & Quinn, 1978) is an instrument dealing with five areas, including Learning Skills, Learning Style, Memory Skills, Number Skills, and Perceptual-Motor Skills. The check is intended for administration during the second term of the infant school (i.e., the kindergarten stage).

[5] The Illinois Test of Psycholinguistic Abilities (I.T.P.A.) (Kirk et al, 1968) is a comprehensive instrument evaluating abilities in three dimensions: Channels of Communication (the auditory-vocal and the visual-motor); Psycholinguistic Processes (the receptive process, the organizing process, and the expressive process); and Levels of Organization (the automatic level and the representative level).

[6] The McCarthy Scales of Children's Abilities (McCarthy, 1972) is an individual test of mental ability of interest to educational psychologists and clinicians. The test yields six scores: Verbal, Perceptual, Performance, Quantitative, General Cognitive, and Memory and Motor.

[7] The British Ability Scales (Elliott et al, 1978) is a psychologist's tool kit consisting of twenty-four scales organized in six main areas: Speed, Reasoning, Spatial Imagery, Perceptual Matching, Short-term Memory, and Retrieval and Application of Knowledge.

[8] The Wechsler Intelligence Scale for Children (W.I.S.C.)--Revised 1974 Edition (Wechsler, 1974), is a psychologist's instrument in which five of the tests are verbal and five are performance tests.

[9] The Swansea Evaluation Profile (Evans et al, 1978) is designed for assessing entrants to the infant school in need of compensatory education, for children aged four years eleven months to five years four months. The instrument provides an indication of "at risk" or a profile whose main elements are: score in English Picture Vocabulary Test (an anglicised version of the Peabody Picture Vocabulary Test); socio-cultural background; school adjustment using Rutter Questionnaire; and teachers' estimates of progress and learning difficulties.

[10] Multiple Regression Analysis is a statistical procedure for predicting probable score in another field of activity or at a future date from data obtained from two or more measures in related fields. The correlations between each predictor measure and the predicted performance are determined by experiment; a formula is used to derive

weighted score combinations of predictor measures which maximize prediction--but this is a post-hoc procedure. Before the weights are used for decisions with non-experimental pupils, the accuracy of prediction should be verified by mounting cross validation studies on further samples.

[11] Assessments in Nursery Education (Bate & Smith, 1978) were developed to provide teachers with a readily available simple means of assessing and evaluating the development and performance of nursery children, ages 2 3/4 to five years. The procedure utilizes concise relevant descriptions of children's activities, reflects generally increasing maturity and encompasses broad ranges of development while requiring mainly everyday materials and equipment. Based on an observe and/or perform → describe → record rationale, the assessments are summarized in a convenient record.

[12] The Learning Ability Tests (L.A.T.) (Hegarty, 1979) was constructed to enable an assessment of the learning ability of young immigrant pupils to be made without recourse to verbal instructions or verbal responses. It was designed to avoid the situation whereby a disproportionate number of immigrant children were placed in special education, a practice which was leading to concern.

[13] D. Montgomery's (1979) Visual Pattern Recognition Test, and the accompanying exercises, are concerned with "reading readiness". The test is based upon a broad theoretical consideration of visual perception in relation to lower case letters, and is designed to locate pupils with problems of letter recognition. Teachers may administer the test. Empirical studies with pre-publication materials demonstrated the efficacy of the materials.

[14] Compare with George Bidder, a nine year old who calculated mentally at high speed. He quickly answered Queen Victoria's question, "How long would a snail take creeping that distance (838 miles from Land's End, Cornwall, to the extremity of Scotland at Farret's Head) at the rate of eight feet a day?".

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IDENTIFICATION AND INTERVENTION: A EUROPEAN, PARTICULARLY SCANDINAVIAN, PERSPECTIVE

Dr. Karl-Gustav Stukåt

INTRODUCTION

The variation between European countries is, of course, so considerable that it is impossible to find a common educational perspective and this is so even if one limits oneself to western European countries. There are, however, some general trends, such as an increasing interest in early childhood and quantitative expansion of child care and education facilities. There are also "vertical" and "horizontal" expansions, or firstly, moving education and care downward in age and, secondly, integrating educational, social and health services into a broader programme of stimulation for children. But these features are not unique to Europe. Some of these tendencies are, perhaps, more pronounced in Canada and the United States than in some European countries.

What I shall present, therefore, is only a glimpse of developments in Europe which relate to the topic of this conference: identification and intervention. It should be noted that greater attention in Europe has been paid to intervention than identification. It is also noteworthy that even in the relatively short time span since 1970, changes in the focus of innovative educational work can be observed. The content of a 1971 Council of Europe symposium held in Finland was, for example, dominated by papers on development and evaluation of alternative preschool programs. These programs were, most often, more structured than traditional kindergarten or nursery programs. At that time, little attention was paid either to compensatory education or to identification problems. Only a few years later, when I completed a 1974-75 survey of current European trends in early childhood research, the situation was somewhat changed. Compensatory programs were being developed in several countries and, related to these activities, identification problems were at least touched upon, even when they did not constitute a major part of the discussion or research. In this paper, several distinct programs in Belgium, France and England will be presented, before outlining the O.E.C.D.-C.E.R.I. (Organization for Economic Cooperation and Development-Centre for Educational Research and Innovation) project and, in more detail, several Scandinavian models.

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EUROPEAN TRENDS

A Belgian Research Program

One example of compensatory activity in Europe is the Belgian co-operative project in which a number of university institutes, including those of Brussels and Ghent, participated. One of the common objectives specified by the project was the execution of research on diagnosis of and compensation for socio-cultural handicaps.

The emphasis of the Brussels project has been on analysis of early development. The rationale of the "psychogenetic" approach chosen was that causes of socio-cultural handicaps are, to a large extent, found early in an individual's history. Any compensatory action which takes into account only current symptoms is, therefore, likely to be superficial. The aim of the Brussels team, working with children one to two years of age, was to identify patterns of relations between parents and their children which are critical and possibly deleterious to later development. Parental attitudes were studied by means of open interviews with the mothers, which, when content analyzed, revealed a number of attitude variables assumed to be significant to development. There was also an attempt made to identify crucial elements less vaguely than "warmth", "verbalization", or "sensory stimulation".

In order to detect which variables represented critical experience for the child, the relationship between the attitude variables and a number of indicators of developmental level were studied. Additionally, children from various social milieux were included in the investigation. The reason for this was that although some critical experiences are found regularly, but not exclusively, in underprivileged environments, harmful conditions may exist in various environments, although possibly more easily masked. The investigators have asserted, justifiably, that economic, cultural and social factors are merely coincidental, and not necessarily explanations of underdevelopment. The orientation of the Brussels project thus has several components that are similar to the study previously described by Dr. Shipman.

The Ghent project also embraced both analytic study and action research. Information about the home environment was obtained from parents of two different social strata by means of questionnaires. An important finding in the study was that there was more variation within a given social stratum and more overlapping of strata than is generally assumed. Another observation was that "social stratum" or "social class" had limited value as categories, and could only be used as a point of departure for establishing classification criteria.

Generally, the experience from the Belgian compensation study led to the conviction that current compensatory approaches were too narrow. From this point of departure, a broader "activation" program was designed, with the principal concepts of the new model described as follows:

1.- From compensation to activation: "compensation" is centred on the child's deficiencies; "activation" emphasizes its positive abilities.

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2.- From compensation to individualization: compensatory education aims at adapting the child to a uniform curriculum; adaptation should also proceed conversely, by adapting the school curriculum to the needs and abilities of the individual child.

3.- Broadening of aims: attention should be given to social and personality development, and activities to stimulate this development should be integrated with cognitive training.

4.- Programme for an entire class, and for all children: separation into small groups tends to preserve existing patterns in the rest of the school.

5.- Broadening the area of infleunce to include not only the children but also their teachers: increase the teacher's ability to perceive different cultural patterns and to choose strategies in the light of such knowledge.

6.- Influencing the home environment and increasing co-operation between school and home.

French Research on the Causes of School Failure and the Compensatory Role of Preschool

The Centre de recherche de l'éducation spécialisée et de l'adaptation scolaire (C.R.E.S.A.S.) in Paris has conducted research into the causes of school failure at the primary level, with particular focus on causes identifiable in the preschool years. In one project, four thousand children have been followed from nursery school to the first grades of primary school. Their teachers were asked to report children who experienced difficulties at school, and who were then examined by psychologists. It was found that the criteria for identification of difficulties were subjective and random. The number of children reported (on the average, fifty percent of the age group) varied considerably from school to school. The judgments of the teachers and psychologists seldom concurred. Frequently, different children were reported from one year to the next. Furthermore, a sociological questionnaire revealed striking differences between children from different social levels. In the first grade, sixty-three percent of working class children, as opposed to one percent of middle class children, were reported to be educationally retarded. It should be noted that the respective proportions in the population were forty percent and fifteen percent.

The above findings have elicited a number of special studies at C.R.E.S.A.S. The general hypothesis of these studies is that school failure depends more on social and educational factors than on individual characteristics. This hypothesis is also formulated as a criticism of the "pathology model" as an explanation of educational difficulties. In the light of this assumption, a study of socio-economic-cultural characteristics of children's families was carried out in fifteen nursery schools. Among the problems being analyzed were parent differences in attitudes to children and school, what parents from different milieux expect from school, how schools handle differences among children, and what may be done to make positive use of these differences. The relationship between certain family factors (e.g., mothers' employment and family dissociation) and school problems was also studied by means of longitudinal analysis. Preliminary observations have not borne out popular beliefs about the relationship between these variables.

Other features of the C.R.E.S.A.S. research are frequent use of a socio-linguistic approach, and a continuous critical analysis of conventional test methods. Intensive study of children's behaviour in test situations has revealed that children's true achievement potential may easily be underestimated because of situational and linguistic factors. In general, the C.R.E.S.A.S. research is relevant to preschool discussion mainly because it has shed light on the multiple causes of early school failure. A natural conclusion from the studies is that preschool programs can prevent school failure only to a limited extent as long as school norms and standards are too rigid, subjective, and socially biased.

The 1967 Plowden Report was an important factor in stimulating compensatory education research in Britain. The discovery that a substantial portion of the variance in school performance could be attributed to parental attitudes and home circumstances made it urgent to develop and test various forms of "positive discrimination" for children in "education priority areas" (E.P.A.'s). Such research has, to a large extent, been action oriented. This was true of the E.P.A. Action-Research Project, whereby schools meeting a number of E.P.A. criteria (social class composition, family size, overcrowding, housing standard, cash supplements, absenteeism, immigrants, retarded/handicapped pupils, teacher turnover, and pupil turnover) in four towns took part in the experiment.

In addition to the provision of educational programmes in a strict sense, various broader and socially oriented activities were launched. In Liverpool, for example, experiments were mounted to strengthen the links between school, parents and society at large; mothers were invited into the classroom, exhibitions held in shops and pubs, newsletters produced, and the organization "Priority" set up for the purpose of developing and disseminating model schemes for E.R.A. work among schools. In Birmingham, "home-school liaison teachers" were employed to function partly as teachers and partly as social workers. The experience gained from this wider social-educational approach is seen as a step towards a "community school", "linking schools to their users--parents, teachers, employers, officials, social workers, as well as children".

Another project was the "Compensatory Education Research Project" in Swansea, with an interesting feature in its development of a screening procedure to identify those infant school entrants who are in need of compensatory education. The diagnostic part of programmes for disadvantaged children had been given, to date, comparatively little attention. Following five years of developmental work, the "Swansea Evaluation Profiles" were designed, in order to provide a composite picture of the school entrant, define groups of entrants likely to develop learning problems unless special help is offered, and predict future attainment in basic subjects.

INDIVIDUAL OR SOCIAL APPROACHES

The Swansea project seems to represent a more markedly diagnostic and individual approach to the compensatory problems than most other British and European projects. There has been some European discussion about the advantages and disadvantages of individual versus social criteria for selecting children for special support, and for giving emphasis to educational versus broader social compensatory action.

The French sociologist Perrenoud distinguishes between two models: that which differentiates education according to social class, and that which differentiates according to the discrepancy between the child's actual level and school expectations. The first orientation has so far been the most common in compensatory action, but Perrenoud argues that preference be given to the second. He argues that group or class oriented action does not adequately take into account the heterogeneity which exists, and which is often experienced as discriminatory in a negative sense. Instead, priority should be given to individualization, or at least to small group differentiation in the choice of model for compensatory education.

Trends along the lines advocated by Perrenoud and others are noticeable in European compensatory preschool activities. Thus, the need for additional, not only equal, educational stimulation for disadvantaged children is clearly recognized in United Kingdom measures to bring about "positive discrimination" in educational priority areas. Dutch and Belgian experiments are also based on the conviction that not only the school but also the home environment must be enriched in order to enhance equality of opportunity. The individualization principle is strongly adhered to in Scandinavian education. In these countries discussion and plans are not centred on compensatory programmes for groups of socio-culturally handicapped children but on individual help to "children with special needs", whatever the origin or cause of the child's difficulties. It should be noted, however, that the special programmes for immigrant children and for children in sparsely populated areas in the Scandinavian countries are, most often, group oriented.

An individual approach to compensatory education does not, however, exclude a social approach. Halsey, who worked on the British E.P.A. Action-Research Project, argues in favour of a combination of the two approaches. He points out that tension between social and individual definitions has been a central theme in the history of the social sciences and public policy. This is borne out by two examples of human problems, unemployment and suicide. In both cases, explanations, as well as actions, have been derived from social and individual aspects. But only when the two approaches have been integrated has a complete account of the phenemona been possible. The thesis of a combined approach in compensatory education is also supported by the argument that both the social and the individual approach have their distinctive limitations and weaknesses and are complementary. For the social approach, there is the "ecological fallacy", the risk of overlooking individual characteristics and individual circumstances. The individual approach, on the other hand, is likely to over-emphasize schooling factors and neglect socio-economic causes.

Halsey recommends that a distinction be made between different units to which positive discrimination can be applied: nations, regions, districts, schools, classes, and families. Addition of the individual as a further unit would complete a macro-micro continuum. The individual unit is included in an illustration of combined efforts in compensatory education:

> Looked at in this way, a programme which focuses on the national organization of pre-schooling, or a second programme which focuses on realizing the principle of the community school, or a third programme which concentrates on psychological tests to predict the likelihood of subsequent failure in the case of individuals, can all be fitted together coherently in educational approaches to the mitigation of disadvantage.

Comments on Compensatory Projects

One common tendency in many quarters in Europe is to take a critical view of compensatory education. Dissatisfaction with this concept in its originally established sense has many aspects and forms of expression. It is said to draw attention away from social and economic causes of inequality; to accept middle class standards and tend to regard deviations from them as pathological symptoms; to imply deficiencies in the child and its home rather than in the school system; to be directed to segregated groups defined by their social level; and, often to rely on purely educational programmes for remedying problems which have deeper and broader social roots. In spite of such critical arguments against compensatory action it is generally agreed that numerous preschool children for various reasons (and not only because they are "socially deprived") need special help, and should be the subject of "positive discrimination". But there is a growing conviction that this help should not be given indiscriminately to particular social groups. Instead, a flexible set of individual and social forms of approach is needed. Another prevailing condition attached to optimal compensatory action is that it not be limited to school, but should include, additionally, the home and community.

O.E.C.D.-C.E.R.I. EARLY CHILDHOOD PROJECT

A current European development trend is reflected in an international project sponsored by the Centre for Educational Research and Innovation within the Organization for Economic Cooperation and Development. The project was started in 1974 and is still ongoing; it is now being finally reported. The project has run through two rather distinctive phases. In its first phase, it was called "Early Childhood Education", and was directed towards two activities: to follow five research and development projects in different member countries, and to analyze policy issues of child care. The five projects were:

1.- Queensland Preschool Correspondence Project: to develop and evaluate a preschool programme for children in sparsely populated areas.

2.- Deutsches Jugendinstitut Preschool Project: to provide social stimulation in a programme built on interest areas and also including extensive material production.

3.- The G.E.O.N. Project: a Dutch compensatory programme to provide for socially and culturally understimulated children.

4.- The Västmanland Project: a Swedish programme with emphasis on the transition between preschool and primary school.

5.- Development Continuing Project: an American program to provide follow-through school stimulation measures begun at an early age. (It can be noted that O.E.C.D. has non-European member countries, although in terms of numbers, the European member countries dominate the organization.)

This first phase of the C.E.R.I. project had a clear educational orientation. A re-orientation took place in 1976, when the need for integrating educational actions into a more comprehensive socio-economic action programme was brought to the fore. Characteristic of the new approach was a wider social view of children's development, as opposed to a mainly educational aspect. Institutional care (mainly nursery school and kindergarten) was regarded as a part--but only a part--of child care. Theoretically, the concept of "socialization" was given priority over the concept of "education", although this change was formulated in rather soft terms. Regarded as a goal, emphasis on socialization meant that personality development, not only cognitive growth, was the aim of child care. Regarded thusly, socialization takes place not only through formal education, but also through learning in many other social situations.

From this new point of departure, four topics were chosen for the continuing C.E.R.I. project: possibilities and limits of coordination and integration of services (e.g., health services coordinated and integrated with educational psychology services); models of social management of children's services and of participation both of local communities and within institutions; daycare; and production and diffusion of knowledge about children.

Connected with this second phase, the name of the C.E.R.I. project was changed to "Early Childhood" (without "Education"). The member countries were invited to prepare national papers on one or more of the topics outlined above. The papers have been discussed at one meeting as preparation to the final summarizing report. Neither in its first phase, characterized by an educational perspective, nor in its second, with a more general social perspective on child care, has the identification problem been brought to the fore. However, if one looks at the Scandinavian development which has closely followed the direction of the C.E.R.I. project, one finds that the identification issue arises and is being explored along new lines.

SCANDINAVIAN TRENDS IN EARLY IDENTIFICATION AND INTERVENTION

In the following, I shall present some recent Scandinavian trends of early childhood care and education which bear upon the problems of identification and intervention. I shall mainly refer to the Swedish situation, but the development is rather similar in Denmark and Norway, so what I describe is, on the whole, characteristic of the Scandinavian countries.

Division of Responsibilities

For administrative purposes, Sweden is divided into 277 municipalities, 24 county council areas, and central national boards (such as the Board of Social Welfare). The *state* or national responsibilities related to child care include parental insurance, child allowances and housing allowances. As to the first mentioned of these, all parents have eight months paid leave of absence in connection with childbirth. Parents decide for themselves which of them is to utilize this leave, but it is not possible for both parents to be at home simultaneously. Parents can take an additional month's leave, but in this case they are only compensated for a very small proportion of their loss of earnings. Benefits for the first eight months are the same as for illness, i.e., almost full salary.

When children up to and including the age of twelve years are ill, their parents are entitled to stay at home and receive compensation under the parental insurance system. The benefit days thus available total up to sixty, as established by a recent Parliament decision. These days can also be utilized for visits to preschool institutions or to child health care. The parental insurance scheme forms part of the general scheme of social security, which is financed by a charge on incomes and by a contribution payable by employers.

County councils are responsible for institutional and non-institutional medical and health care, including habilitation of the handicapped. Maternity health care precedes child care. Ante-natal care implies that practically all expectant mothers are kept under medical observation from the second or third months of pregnancy. Normally this observation involves ten to fifteen visits to a medical centre. Expectant mothers are also given the opportunity of attending maternity education courses led by the midwife. Up to about fifty percent take part. In these courses, information is given concerning pregnancy, childbirth and motherhood seen from physiological, psychological, and social viewpoints. The expectant mothers are also given special training to prepare them for the parturition process. A more comprehensive parent education programme has been launched by Parliament recently, making voluntary parenting workshops available by local community initiatives.

Child health care comprises the medical observation of preschool children, i.e., children from birth to seven years. The main emphasis of these activities is on the first year of life, when health care amenities are used by almost ninety percent of children. After this, the participation rate declines to about fifty percent of those children aged five years. The child's health is checked in order for any handicaps or developmental deficiencies to be revealed at the earliest possible stage. Preventive activities also include vaccinations, dietary counselling and information concerning accident risks. All children are given hearing and vision tests at an early age. This system of medical checks is generally regarded as efficient for the detection and treatment of physical illnesses and handicaps. When in 1970 an intensified control of four year old children was conducted by the National Board of Health and Social Welfare, very few medical handicaps were detected which had not been observed previously. On the other hand, quite a number of psychological problems, not given earlier attention, were found.

The *municipalities* are responsible for preschool facilities, including part-time nursery school for children four to six years old, as well as full day nursery for children six months to six years of age. Attendance is voluntary, but local communities must offer preschool places for six year olds according to parental demands. Children begin school at age seven. It should perhaps be noted that the school system is relatively uncompetitive, with no grading prior to grades eight and nine, and no organizational differentiation during these nine years. To clarify the municipal obligations, the following outlines legislative directives:

> Children who for physical, mental, social, language or other reasons require special support for the sake of their development are to be offered preschool places earlier than is indicated in Section 5 (i.e., at the age of six) or are to be given priority in the award of leisure centre places, unless their need for such support is provided for in some way.
>
> The municipality shall ascertain, by means of outreach activities, which children need to be offered places in preschool or leisure centres.

Outreach Activities

Until recently, outreach activities concerning small children have been of limited scope. The county councils have established procedures for identifying mentally retarded, hard of hearing and sight handicapped children. Thus, the local communities have no tradition to build upon when facing the new duty to trace all young children in need of special support. This new situation has elicited a lively discussion and experimentation. From the many experimental outreach activities currently underway, I shall give brief accounts of a few: the Haninge model, the Gärdsten model, the Huddinge model, and the Mölndal model. Among the many problems, those of how to define "children in need of special support", how to avoid making outreach a negative social control, and how to establish cooperation between municipal and county administrations and between welfare, health and educational personnel, are particularly interesting and delicate.

The Haninge model. Haninge is a suburban community south of Stockholm with about 50,000 inhabitants. Families with young children make up a large part of the population, and the number of children from birth to six years of age is about one sixth of the total population. Twelve percent of this group are immigrant children.

Haninge's outreach activities were connected with the child care centres, and were directed toward all four year old children and their parents in conjunction with a four year check-up at the centres. The child care nurses and social workers cooperated in the program, and shared common reception offices at the centres. Both interviewed the parents and their children, and informed them both verbally and with pamphlets regarding the social services available for childfamilies and regarding activities for children arranged by other organizations.

On the basis of this contact, the nurse and social worker at each centre discussed the need for extra support for some of the children, divided into three main categories, as follows: the *language* group, including children in need of verbal stimulation and speech correction, and immigrant children; the *mental-medical* group, including children showing signs of anxiety, aggression, mother fixation or motor deviation, and the *social* group, including children from multi-problem families with serious problems, and children in danger of various kinds of abuse.

Of the nine hundred children contacted for outreach, twenty-five percent were judged to be in need of support and stimulation. Thirty-seven percent of the group needed language stimulation, half of whom were immigrant children. The number of children designated as requiring support varied considerably among the different districts of the community. The most common recommendation (forty-four percent) was priority placement in day care, family day care, or nursery school. Fourteen percent of the children were referred to the psychological guidance centre. Other action included letters of introduction to open preschool, total preschool or to play-hours groups, as well as continued observation at the child care centre and referral to social welfare. It was reported that the cooperation between community staff (the social worker) and county staff (the nurse) had made it possible to cover a broader range of problems than would have been feasible for either of the organizations operating separately.

The Gårdsten model. Gårdsten is a new district in the city of Göteborg with about 20,000 inhabitants. In 1974 the Social Welfare Department and the Child Health Department started outreach activities with ages groups of children two months, eighteen months, and three years of age. Home visits were made for the two month old children by a nurse and a social assistant. The eighteen month old children were examined (in developmental screening) by a psychologist. With the three year olds, individual contacts were made with the children and parents by the nurse and the social assistant. The team of the nurse, psychologist, and social assitant worked with parents both in group sessions and individually, if they were interested in support from the team. To begin with, attention was given mainly to the child's symptoms, but later on, the total family situation was taken up.

Four categories of problems were thus identified, as follows: problems related to family situation (e.g., disturbed relations between family members, permanent economic problems, physical and mental illness in the family); individual handicap of the child (e.g., motor disturbances, mental retardation); immigrant children whose parents speak primarily mother languages and not Swedish; and follow-up problems (usually temporary family needs in connection with accidents, temporary unemployment, etc.). When the experimental outreach activities started, a list of priority criteria for receiving special support was developed, including the following symptoms and characteristics: *physical:* motor dysfunctions, heart disease, allergies, epilepsy, hearing loss, sight handicap; *psychological:* over-anxiety, mother fixation; *restlessness:* passivity, peer relations; *language:* speech difficulties, immigrant children; and *social:* restriction of space, isolation, lack of stimulation.

No less than forty-eight percent of all the children included in the experiment were judged to be in need of support and stimulation. It was decided, however, that the concept "need for special support" was a vague one, and the list of criteria of limited value. Identified problems were often constellations of individual and social factors, and intervention was required on different levels simultaneously. Furthermore, the nature of the problems often changed over time, which made definite labelling inadequate and not very useful.

The actions taken for the Gårdsten children were similar to the Haninge recommendations. One new feature, however, was to establish a support team to work with children in preschool and leisure time homes. The team consisted of two preschool teachers and a leisure time educator who visited day care centres, nursery schools and leisure time homes, working indirectly by providing resources and support to the staff instead of providing direct service to the children. As a rule, the team support work consisted of three periods: interviews, observation and treatment. During the first, or interview period, the problematic situation was analyzed, but no recommendations given. During the second stage, the team developed, through participatory observation of the child and environment, an independent view of the situation. The third, or treatment, period involved discussion of alternative actions directed toward both the child and the environmental factors of the situation. Most often, help was requested for dealing with acting-out, impulsive, restless and destructive children. A general conclusion drawn from the outreach and team work was that changes in the day care situation, routines and group social patterns were more efficient in problem solving than were changes in individual approaches.

The Huddinge model. Huddinge is a suburban community outside of Stockholm. The experiment took place within a district in Huddinge with a population of 4,000. In 1974, a family service centre was established. The staff consisted of a team of child care personnel (pediatrician and nurse), a social worker (called family assistant), and a preschool teacher. In addition to the work at the centre's reception office, the family assistant, preschool teacher and the nurse acted as group leaders in parent groups. The staff also participated in a professional development course about child care which laid emphasis on problems connected with cooperation and coordination among different kinds of services. The gain reported from the experiment was that contacts between families in the area had been increased and information from social, educational and medical agencies could be coordinated.

The Mölndal model. Mölndal is an industrial city with a population of about 50,000 people. The coordination between social welfare department staff of the municipality and child care staff of the county started with an inventory of children in need of special support. This inventory was jointly compiled by nurses at chid care centres and by preschool teachers at day care centres and nursery schools. Twenty-eight percent of the day care centre population and ten percent of the child care centre population were judged to be in need of special support. Some time later, a cooperative group was established and consisted of a pediatrician, district nurse, child care nurse, psychologist, social worker, speech therapist, and an assistant from the nursery schools. Members of the research project also participated in the cooperative group, who discussed individual children and families judged in need of psychological or medical help. Following discussion, recommended action was decided upon. As in Haninge, the preliminary list of criteria was abandoned as being too rigid and mechanical.

SUMMARY OF THE OUTREACH PROJECTS

The main principles behind the outreach activities are the following:

1.- No sharp line is drawn between children who need special support and other children. Sometimes less than ten percent have been judged to need extra help, sometimes as many as fifty percent.

2.- Only exceptional children are placed in separate groups or otherwise labelled as deviant.

3.- The measures taken to help the child are directed to the whole personality and not limited to isolated functions.

4.- Consideration is given to the fact that problems are often not only individual but also involve the child's total social situation. As a consequence, individual therapy is complemented with actions that can influence family relations and an even wider social network.

5.- Most problems can best be solved in the child's natural environment. Short treatment visits to specialists are seldom sufficient; more successful intervention often comes from the adults with whom the child spends most of its time, such as parents or nursery staff. With adequate knowledge and resources, these people have good opportunities to help the child. It is therefore considered an appropriate strategy to support parents and personnel in their stimulative tasks. As far as possible, expert assistance should be coordinated with the daily and ongoing actions from the child's environment and relationships.

6.- And finally, the outreach activities with the broad purposes described here imply cooperation between people responsible for social, educational and medical charges, both on field and the administrative levels.

It is hoped, then, that this survey of European, and particularly Scandinavian perspectives of early childhood identification and intervention projects have conveyed not only the possible variations in approach, but also the common themes which may be traced in many of the recent programmes.

SECTION TWO

IMPLICATIONS AND APPLICATIONS

2 IMPLICATIONS AND APPLICATIONS: INTRODUCTION

Although the contributions in this section seem diverse, they are linked by the themes of application and practice. It is important, however, that we not allow an artificial distinction to develop between theoretical perspectives and actual practice. It is for this reason that the first paper in this section by Morgan offers the reader several fundamental guidelines for analyzing programs.

The bulk of this section consists of papers discussing procedures and techniques in current use. Bryans presents and discusses the Croydon Check List and some research data pertaining to it within one of the British education systems. Palfrey describes the history and components of a paediatric assessment device. There follow summaries of the procedures used by seven Ontario school boards. O'Bryan then discusses the research aspects of the Windsor procedures, the best known and most widely adopted system in Ontario. Stott presents his work on individual assessment of young children with suspected learning difficulties and relates it to issues raised throughout the Conference.

PROBLEMS OF PREDICTION IN EARLY IDENTIFICATION

Dr. Griffith Morgan

INTRODUCTION

Prediction of progress in school is not the major objective of an early identification procedure. Dr. Shipman's studies of groups of Head Start children over a time period from ages three to nine have brought out the complexity of influences on children's development and the reciprocal interaction between the factors affecting the child's progress or failure. A range of other measures, such as classroom observations, must be used in addition to traditional testing if we are to describe and understand these influences. A fuller discussion of such factors is found in the paper entitled "Problem and promise in early identification" in the first section of this volume.

However, the validity and reliability of the measures used are still of major concern. Only to the extent that measures used relate to children's real life progress and can be used from time to time, or by different persons to obtain effectively the same observations, can we be sure that our observations and our intervention can be replicated, under control.

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VALIDITY AND RELIABILITY

"Validity" of test or observation measures can best be defined as the extent to which measures are similar to one another or can be generalized; that is, the extent to which one set of measures of performance, reasonably accessible and economical to use, can be employed to explain, substitute or account for another set of performance measures or other tests of real life performance.

"Reliability" of test measures refers to the consistency of the set of measurements given to a group of individuals. We may be interested in consistency from time to time on the same test, or in knowing how similar two forms of the same test are so that, essentially, one form can be substituted for another with a known degree of error.

The variation which takes place in test/observation scores may be due to variations or changes in the individuals tested, variations in the test, or variations due to occasion of testing. The emphasis, in assessing reliability, is on estimating chance error of measurement which leads to misclassification of individuals or to poor prediction or explanation of performance. However, built into variations on tests are other factors such as practice effect, fatigue, fluctuations due to the material of the test itself (knowledge of the material tested and understanding of the way the test items present the task), and fluctuations of efficiency and knowledge from time to time in the individual tested.

One basic paradox in the concept of reliability is that we wish to obtain highly consistent measures from one time to the next, but also wish to observe any change that takes place. A highly reliable test may be so constructed that it is rather insensitive to change of performance; observations which are sensitive to changes in performance may appear to have low consistency of measurement from one time to another, or from one test form to another.

Reliability may refer to the "external" consistency of the test instrument (or observation) with its use on a second occasion. It may refer to the "internal" consistency of the test itself, that is, the correlation between two random or selected halves of the test, i.e., checking the test against itself on the same occasion, as it were. Or it may refer to estimates in which the amount of significant variation between individuals tested is contrasted with the variation (or error) within test items.

A number of basic formulas for internal consistency have been derived, ranging from Kuder and Richardson's (1937) formulas 14, 20 and 21, to Guttman's (1945) "coefficient alpha". All of them derive logically, however, from "analysis of variance" models (Hoyt, 1941), in which the significant variation due to individual performance is compared with the variation due to error, i.e., to variation within test items and other error variance. The assumption, in the use of these statistical estimates of "internal" consistency, is that they can be used to predict external reliability, if this has not yet been obtained experimentally. It should be noted, though, that internal consistency estimates, since they are limited to one occasion on one test form, are likely to provide a rather higher estimate of reliability than will occur in "real life/real time" repeat measurements.

The analysis of variance models used for internal consistency estimates of reliability apply to all measures of reliability. Essentially, we are interested in estimating the significance of variation between individuals on some task (that is, the consistent variation due to individual skill or ability), as compared with the sources of variation due to change in time (occasion), the specific test form, practice, or a change in performance (such as learning) which has been accidentally or deliberately introduced. The error will comprise any or all of these factors lumped together, and we often cannot distinguish the sources of error.

If *reliability* is concerned with finding how closely two apparently very similar test instruments are related, *validity* is concerned with finding how closely related are two different samples of performance, which are similar in content (it is hoped) but dissimilar because they consist of different tasks and are possibly assessed at different times. There is always some element of prediction in statements about the validity of test/observation instruments.

Concurrent validity is when the test used correlates significantly with another more or less similar measure given at the same time. The measures used as the criterion may be another set of tests or a "real life" criterion distinct from tests, such as a teacher's estimates of children's ability or behaviour. This kind of validity measure is useful in giving a check on the effectiveness of our test instruments "here and now", in the hope that this consistency of performance will extend to the relationship between the test and to future performance by the child. There are examples of this in the Windsor Early Identification Project (Ontario Ministry of Education, 1976). This identification battery of tests has been correlated with another set of tests, the Smith-Francis battery (described in the Windsor materials), given to the same children at the same time. Correlations are in the region of .78. The identification battery was also compared with teachers' estimates of children's characteristics, giving a correlation of about .55.[1]

Construct validity is the degree of the test's association with a "construct" of ability or other behaviour which is intended to represent an important characteristic of the individual or some ability. The "construct" is defined in various ways. It may be based on factor analysis[2] of the relationships between a number of test/observation measures, giving rise to more or less important and significant factors which represent what is common to a group of tests. There is an example of this in the Windsor Early Identification Project. The identification battery was factor-analysed to produce factors which represented verbal-academic performance, visual-motor skills, teachers' perceptions of children's behaviours, and so forth. The identification tests related significantly mainly to the verbal-academic factor, and there was little relationship with the social-medical factor.

At other times, a construct may be based on a specific group of tests or performances, or the research worker may simply describe and define performances which are believed to be good examples of consistent kinds of behaviours, and which, it is hoped, have some specific meaning (for example, "extraversion"). For example, the Windsor Early Identification Project uses the Smith-Francis tests as a construct of performance. These tests (of verbal, visual, and auditory perception) are basically a brief "pre-reading" battery used in Windsor to measure the performance of children at the kindergarten level and to select children for appropriate placement in class. The assumption made is that the Smith-Francis tests represent a useful construct of educational performance; the further assumption is that these tests in turn correlate significantly with "real life" performance in school.

Construct validity is useful in exploring the relationship between experimental tests and the constructs (based on existing tests or factors) to which we wish to anchor them; it is useful in describing and explaining types of performance. It will have its place in the study of early identification procedures, but is of less practical importance to the teacher than concurrent and predictive validity of tests/observations used to estimate performance in "real life/real time" situations in the classroom.

PREDICTION

In a sense, both the above uses of validity are "prediction" of performance on a closely similar set of measures, on one occasion. Prediction in the proper sense enables us to estimate from our tests the future performance of children on other, dissimilar and "real life" kinds of progress. Obviously, there are many more disturbing factors of error and chance in this situation. "Real life" prediction is likely to be less precise than that based on concurrent or construct validity. In fact, *no* facts on predictive validity are given in the report of the Windsor Early Identification Project, so we can only guess at the practical usefulness of this technique.

In one sense, both "validity" and "reliability" measure how far one can *generalize* from one estimate of performance to others.

Validity is consistency of meaning (a trait, a characteristic), and reliability is consistency of performance on that dimension. A fundamental equation by Gulliksen (1950, p. 353) illustrates a relationship which is important for educational prediction as well as for clinical classification or diagnosis. This equation formally illustrates that for good differential prediction, the two abilities measured must be distinct and meaningful (i.e., correlated as low as possible) whereas each dimension of ability must be as self-consistent (reliable) as possible.

In real life situations, we often find the following: first, interesting and significant abilities or traits which are not too stable; second, abilities and traits which are highly reliable but have no particular significance; and, third, the usual situation traits or abilities which are more or less significant and clearly defined, and are also more or less reliable.

Campbell and Fiske (1959) have suggested means of comparing simultaneously the significance of a trait (its definition or validity) and its reliability or persistence over time. We usually make the best practical decision we can in reaching a compromise between achieving sufficient definition of a trait (validity or meaning) and its stability (reliability).

In recent "generalizability/decision" theory (Cronbach & Glaser, 1957), the distinction between validity and reliability becomes blurred. It is pointed out that we are concerned with describing the ways in which one set of measures (such as our identification procedures) resemble another set of measures (i.e., can substitute for one another or be used as if they were equivalent). "Reliability" in this context is an estimate of the associations between any two sets of measures, not just between closely similar tests or the same tests on two occasions. The problem is to generalize from our prior information on individuals to the later performance we wish to describe or control. Related to this is the task of making decisions based on the best information available (i.e., classifying children, deciding they need remediations, etc.) and for which the amount of error and cost involved can be calculated.

This generalization/decision approach is much more in line with the situation described by Dr. Shipman's follow-up studies of children's progress after identification than is the classical "prediction" approach. The latter attempts to predict complex and unspecified criteria such as the child's future progress from a small sample of screening and identification tests and observations. Emphasis on prediction gives way to emphasis on acute description, analysis, interpretation of performance and its relationship to environmental factors, a seeking for significant factors and relationships of quite complex kinds which span across change in the child's performance; in other words, to a much more "diagnostic" and "prescriptive" approach, aimed at intervention, managment and control rather than simply statistical prediction of outcome.

IMPROVING VALIDITY AND RELIABILITY

It might be thought that validity and/or reliability can be improved indefinitely by lengthening the tests or making them more efficient. In fact, tests can certainly be improved in this way. The reliability of a test can be improved by simply lengthening it, according to well-known formulas. However, the gains from doubling a test in length are not maintained in trebling or quadrupling it; there is a very swift onset of diminishing returns. Usually, too, we cannot extend the length of a test very much or it becomes impracticable in time or cost for child or teacher. Efficiency of discrimination between individual children can be improved by item-analysis and related techniques aimed at making each item and section of the test discriminate better between those individuals who show the ability or trait required and those who have less ability. However, most test material is relatively crude and has much inherent error (e.g., the varying knowledge of the testee, varying motivation, effect of form and wording of the item, practice, change in the testee's actual levels of performance, and so forth). For this reason, there is a limit to the "perfectibility" of test items.

Reliability can certainly be raised, if tests are sufficiently long and efficient, to a level represented by a correlation coefficient of .95 or so. This would account for ninety percent of true-score variance. "Identification/screening" tests, however, are usually short and give a restricted sample of performances. Nor would they reach the level of reliability which is usually associated with rather stable kinds of performance such as arithmetic, based, for example, on one-hundred item (forty-five minute) tests on older elementary-age children.

One might ask whether tests could be improved past the level represented by a reliability coefficient of .95. The answer is no. The inherent factors of instability and error at this level of reliability are already swamping the precision we have gained. In fact, such high estimates of reliability are normally internal-consistency estimates, not estimates in the rough-and-tumble of real life prediction over a period of time.

ERROR OF MISCLASSIFICATION

Just as, in relativity theory, the speed of light is the standard measure for the universe and imposes a boundary beyond which we cannot go, so too in psychological/educational testing, there is a boundary condition: *Axiom 1*, therefore, is that *there is a finite practical limit to the precision of test measurement in practice; the error of misclassification (from time to time, test to test) cannot be reduced below fourteen percent of cases.*[3]

It should be noted that we are speaking of reliability. It is less feasible to expect validity (generalization of our results) to be improved simply by lengthening tests or improving item discrimination. We can often improve item discrimination in relation to a criterion such as the total test score or similar "internal" measurement, but this is no guarantee that the test can be made to predict more effectively the "real life" criteria of performance.

The fact is that we shall always make "errors" in anticipating future performance and progress from our present knowledge. Actually, these are not errors, but rational beliefs, at the time we make our predictions. They turn out to be "errors" only in the light of further knowledge. We can correct, possibly, the "errors" we have already made and detected, but we cannot thereby anticipate or avoid the new "errors" which we shall discover in due course.

STANDARD ERROR OF MEASUREMENT

This must follow from the fact that our information about individuals is imperfect, and that children change in a variety of ways which are more or less unpredictable. The purpose of designing our tests effectively, or using various statistical techniques of generalization/decision, is to allow us to estimate the amount of error which we are likely to make in anticipating and "predicting" progress in children, and arrive at some estimate of the costs (in wrong decisions, inappropriate use of time or resources, and ill effects of wrong placement or treatment of the child). This leads us to *Axiom 2:* hindsight is perfect, but in foresight we shall always make decisions which in retrospect turn out to be incorrect, or based on wrong decisions or wrong information. *There will always be "errors" after the event, and whatever action we take to correct, we shall continue to make "errors", as judged in retrospect.*

Our decisions are fundamentally affected by the standard error of measurement which is, in effect, the reverse of "precision". There will be a range of variation (or "error", or chance variation) around any measurement we make. This is the standard error of differences between mean scores, if we are comparing two tests of performance, or the same test of performance at different times. Whether the standard error is appropriately interpreted as the error of measurement, of substitution, or of prediction (three different formulas: see Gulliksen, 1950) the outcome is an estimated measurement (a mean score) that is not precise but varies over a definable band of scores above and below the mean, with known probabilities. The standard error band is based on the group variations, not the individual's score, but enables us to arrive at some estimates of how much an individual's scores may, on average (from time to time, and trial to trial, on the same test), vary around his or her original performance. The implication is that we should classify and "predict" only within reasonably broad bands of performance, and should attach cautions to the interpretation of an individual score at a given point in time, or on a particular test.

BROAD INTERPRETATIONS

Consideration of the efficiency of tests in discriminating between individual scores at given points in the score distribution (at high or low levels, for easy or for difficult items of performance) indicates that "the" standard error is only an average of the different degrees of precision at different points of the score scale, or for different groups of individuals with particular scores. We would make more efficient use of this information if we looked at the different standard errors associated with different points of the test scale (high, middle and low scorers) and used them to classify children more effectively. There are also implications for the planning of specific test-score distributions so as to achieve the maximum discrimination between children with different levels of ability or progress, for specific purposes. Thus we come to *Axiom 3: the results of screening/identification procedures should be described and interpreted in terms of broad bands of performance.* These bands can be refined by further investigation, use of additional information and continued assessment over time. However, the axiom will hold, in some degree, for any set of observations and at any given time.

FALSE POSITIVES AND FALSE NEGATIVES

Another probably more useful way of looking at the variation which occurs when we assess children is to look not at the amount of true-score variance (a slightly metaphysical concept) or the range of score on either side of an estimated score, but at the actual *proportion of children* likely to be "misclassified" on any given performance. It is recommended that "expectation" tables of this kind (long used in industrial psychology and, to a lesser extent, in clinical psychology) should be used, as well as reliability and/or validity coefficients, in describing how well our test or observation procedures work in predicting performance consistently.

When persons are classified on two occasions (or on two different tasks) as being in the same category, this indicates their stability of performance, which reflects the consistency of the test (either reliability over time, or validity in prediction of the later performance, or both). On the other hand, the persons who change the category do so because of change in them, or in the environment, or because of other "errors" (unpredictable or unsystematic variation). They constitute errors of classification. This situation can best be illustrated by restricting ourselves to a consideration of individuals in the upper, middle, and lower thirds of performance; or even more simply, as arbitrarily "passing" or "failing" on a test.

The following two-way table illustrates what could occur if a population of children are classified as "pass/fail" on one set of tests and then classified as "pass/fail" on a criterion performance at a later date. The table is one which corresponds roughly to the possible pattern arising from a correlation of .5 - .6, between test and criterion (as in the correlation between Windsor Project Identification tests and teachers' estimates).

	First Test			
	Pass	Fail		
Pass	40	20:	60	Second or Criterion Test
Fail	20	20:	40	
	60	40		

It will be observed that sixty percent of cases are correctly classified (pass both times or fail both times), but that twenty percent pass the first and fail the second performance (the false positives) and twenty percent fail the first but pass the second performance (the false negatives), a total of forty percent misclassified.

The important practical consideration is that misclassification affects what we do with the children. It may be assumed, on the basis of the first test, that the "false positives" are apparently likely to continue to perform well, so apparently need no special help or adjustment of program, whereas on the second test they fail to show progress. The "false negatives" appear to need additional help, but on later testing it may turn out that they do not. In a school system, there are implications for using the resources of persons, time and materials to help children most effectively. "Errors" in identifying in time which children need help (or altered programs) and which children do not, will be costly.

It may be felt that the proportion of "false positives" can be reduced, so that attention can be given only to children who have proven need of it. This can be done by varying the cut-off score on the test, by making the test more difficult, or discriminating more severely between the more able groups of children. However, in so doing we shall simultaneously increase the proportion of "false negatives". The converse will occur if we attempt to reduce the proportion of "false negatives" by lowering the cut-off score (making the test easier or more discriminating in the lower range of ability). In effect, any decision involving the classification of children at any point (whether into two or multiple groups) will land us in this dilemma or "scissors-crisis". We cannot win.

As a further example, a typical pattern representing a correlation of .8 or so between test and criterion is the following:

	First Test			
	Pass	Fail		
Pass	50	10:	60	Second or Criterion Test
Fail	10	30:	40	
	60	40		

Here, eighty percent of cases are correctly classified both times, but twenty percent are still misclassified. The important point is that this level of correlation is found in moderate to high levels of *reliability* estimate (for example, the Windsor identification battery and Francis-Smith tests); this level of correlation is about the highest that would be found, in favourable circumstances, for *prediction* between test and later performance.

These findings reinforce the conclusion that, with moderate to good levels of validity and reliability, we do best to classify children in broad groups and bands of ability, and that the evidence from screening tests *does not enable us to diagnose the needs and progress of individuals* except within very wide limits. This finding would confirm the repeated conclusion by Meier (1976) and others that screening and preliminary identification should not and cannot be used for individual descriptive diagnosis, let alone for the prescription and construction of an individual program.

LONG-TERM PREDICTION

There is probably another empirical boundary condition in prediction, based on considerable evidence (particularly from British educational practice) that predictive validity of school performance from tests, over one or more years, cannot exceed a correlation of .80 at best. *Axiom 4*, therefore, is that *the predictive validity of the usual test battery applied to groups of children covering the normal range of ability and a predictive span of one year or more will range between .6 and .8, and will very rarely exceed a correlation coefficient (or multiple regression correlation coefficient) of .8.*

It might be thought that tests could be increased in efficiency and precision of measurement to offset this boundary condition. This is unlikely. In the 1950's, an attempt was made in Great Britain (Watts, et al, 1951) to develop so-called "vernier" tests, or "super" tests, which could be applied to extreme parts of the population, such as the ten percent of the brightest children, in order to spread out their scores, discriminate between them, and measure their abilities even more finely. Such tests can indeed be made at specific difficulty levels and with appropriate choice of items to "stretch" the scores of a given ability group. The Miller Analogies test, for example, has been used to classify and discriminate between bright applicants for entry to graduate programs since 1953. The difficulty is that the predictive value of the super test does not rise in relation to the effort put into creating the test, one reason being that such tests measure a sample of children with a restricted range of ability, and usually do not introduce any fundamentally new problems or items, but simply the same material or process at a more difficult level.

The actual material difficulties connected with choice and presentation of test items (the guessing factor, practice effect, variability of knowledge, function fluctuation in the child) blunt the edge of the supposedly sharply discriminating items. More fundamentally, such tests usually add only more of the same information. What is needed is *additional and different information* about the abilities of the group being investigated. Experience indicates that the wider the sampling of appropriate behaviours, and the greater the variety of sources of information, the better in general will be our understanding of the child's behaviour and our ability to anticipate direction and degree of progress or failure to progress.

MULTIPLE SOURCES OF INFORMATION

This is the principle behind the use of the multiple regression equation and its analogues. In multiple regression, a number of tests or observations are selected as being the best predictors of a given criterion. By suitable choice of tests, and in favourable circumstances, the multiple correlation based on all tests will be significantly higher than the best single correlation of any test with the criterion. Moreover, the tests used for prediction, classification or description of the criterion can be weighted so that each makes its highest contribution to the total performance.

The principle underlying the multiple regression equation is that each item (test) contributing to it should correlate as *highly* as possible with the criterion but as *low* as possible with the other tests in the battery. In other words, each additional test should make a specific and significant addition to the sum of information. This principle suggests that one should seek for a variety of information about the child, and use multiple sources, each as different as possible from the other, as long as each of these can be shown to make a useful specific or independent contribution to the criterion performance (e.g., school progress).

Einstein, in formulating the special theory of relativity, said "there is no privileged standpoint in the universe". He was referring to the definition of time and space, but his theory is based on communication, the capacity of observers to communicate their observations to one another, and the restrictions imposed by the finite speed of light as the basic communication and measuring rod. There are implications for the human sciences too: that there is no privileged standpoint in observing a child, neither that of the teacher, nor the parent, nor the psychologist, nor the doctor, nor the superintendent of schools. Each standpoint may have its own validity, which is not the same perspective as given by another standpoint. The validity must be established in large measure by communication between the different observers as well as by observation of the object being measured.

There is, in comparing sources such as the information available to parents and that available to teachers, what I would call the "Isle of Wight effect". In a major study by Rutter et al (1970), one of the most complete recent epidemiological studies, entire age-groups in an English county were studied. It began with group measures of ability and attainment, and moved upward through progressively more detailed individual observation and assessment. Both parents and teachers were asked to complete the same checklist on children. Parents identified one group of children as having emotional disturbance or behaviour disorder, while teachers identified another, with only a small proportion of overlap between them. An immediate response might be to challenge the validity of either the parents' or the teachers' judgement, or accept only those children identified by both. Rather than concluding that one or the other source was invalid, the authors of the study determined that both sources were correct, but for different reasons and working in a different environment. The "calibration" of the groups of children referred as disturbed was done by having them examined by two independent psychiatrists. Rather than restricting themselves to one source of identification only, the authors of the study were able to examine a much wider range of children and factors. The following two axioms are proposed: *Axiom 5: we should always seek, in attempting to explain and anticipate children's development and progress, a variety of kinds and sources of information; Axiom 6: the "Isle of Wight effect": differences and even contradiction between sources of information should be expected and if possible exploited.*

TEACHERS' ESTIMATES

An example of the use of additional information is the employment of teachers' estimates as part of the identification/assessment procedure. There is considerable evidence, going back to the 1950's or earlier, that teachers' estimates of children's abilities and progress provide excellent additional evidence. The estimates, in suitable conditions, can be as efficient as long batteries of ability and attainment tests and can, in fact, be better predictors of children's progress. This is probably because teachers' estimates are not simply assessments of functioning, as are tests, but contain additional information on the child's persistence and reliability and ways of working--what P. E. Vernon (1953), many years ago, called the "X factor" in adjustment and attainment. Such estimates are valuable to the degree that they can be calibrated by relating them to other measures such as test measures. The scaling can be adequately carried out on practically any test which shows some moderate to reasonable correlation with children's performance. Once used, the test itself can be thrown away, and its contribution built into the teachers' estimates, made comparable between class and class, school and school.

A recent study of entrants to school for the first time in Ontario (Morgan et al, 1979) indicated that teachers' ratings of the child's language level or temperament (persistence, attention span, and adaptability) were effective predictors of performance in objective tests taken at the same time. Both parents and teachers were asked to rate children on nine temperament scales derived from the work of Chess et al (in Morgan et al, 1979). The relationships between the ratings of parents and of teachers were often non-significant statistically, with the exception of a group of behaviours which could be classified as "persistence". Similarly, the predictions (correlation) between teachers' temperament ratings of children and children's test performance were high and consistent for the senior kindergarten group, but much less so for junior kindergarten. The parents' ratings and relationship with test results were much less marked and consistent. This, however, indicates that there are two rather specific sources on times of origin for perceptions of temperament. It would be incorrect to throw away the parents' ratings as invalid until further evidence is available. Data cannot be added together for teachers and parents, in this instance, but it can be contrasted and compared. We should, therefore, expect the "Isle of Wight effect" in gathering and analyzing our evidence on children's characteristics and performance. We should also note that teachers' ratings are indeed useful predictors, evidenced not only in this school entrants' study, but also from data provided by the Windsor Early Identification Project. It too offers good evidence of the useful correlation between test scores and teachers' estimates.

On the other hand, the estimates must be checked. Asked (Morgan et al, 1979) to classify a sample of three children in their classes as being in the upper, middle, or lower thirds (according to ability of the class), kindergarten teachers placed a disproportionately large percentage in the upper third and far too few in the middle and lower thirds. The discrepancy was confirmed by comparison with a wide range of ability demonstrated on a standardized test of vocabulary given to the same children. Similarly, asked to estimate "expectations" of children's performance on a number of common developmental and educational tasks (a total of one hundred and three items, ranging from buttoning up one's coat to reading a few words) at the beginning and end of the school year, junior and senior kindergarten teachers gave estimates which often had little relationship to directly tested performance on similar tasks at the same time. They also overestimated the performance of children by the end of the school year.

Alternatively, teachers' estimates of children's ability or progress can be calibrated by requiring them to submit a small proportion of their children for examination by an independent panel who can administer a wide variety of tasks to the group, and make comparisons between the children drawn from different schools, using test norms or levels of expectation set by the panel as a result of their experience. Only a small number of children (the standard error zone around a cut-off point which represents the division between the more or less able children, or the children with and without obvious special needs) need be examined for each school. The "panel" system has the benefit (see Axiom 5) of introducing a variety of other perspectives and access to a range of other tests and observations, including trial-teaching if needs be, over the course of a full day. The calibration of teachers' estimates and use of a panel system can both be used.

I would contend that teachers can make precise observations in areas of interest to them in the short term, and make specific short-term plans, but that long-term educational objectives tend to be verbal intents, and long-term expectations poor guides to children's actual performance. In other words, there must be calibration and monitoring of teachers' assessments. It should be noted that in such calibration, the test used as standard needs have only a moderate correlation with the criterion and with the teachers' ratings, and that the process of scaling the estimates can be carried out in a simple and economical fashion within each school or school system.

Checklists are also useful adjuncts to tests and observations, particularly in preliminary screening of children to establish the range of attainment or to identify those with special needs. A number of these are available, ranging from those intended to identify special needs (for example, Meier's 1971 checklist for learning disabilities, and the Isle of Wight checklist [Rutter et al, 1970] for behaviour difficulties to those which describe normal developmental levels and expectations (for example, the D.I.S.C. Inventory, Amdur et al, 1979 for pre- and early school age children).

Checklists are not, however, a panacea. We still do not know how teachers use checklists, how they select and focus on various kinds of behaviour. Checklists are certainly not used in the mechanical, neutral way that is often implied when they are developed. There is evidence that teachers prefer, and are better at, focusing on specific aspects of performance or behaviour in particular children, than attempting to rate all aspects of behaviour at one time for all children. We do not yet fully understand the "constructs" evolved by teachers (as by every human being), to identify, classify, and interpret the patterns of response observed in children. It would be useful to follow the lead given by Kelly (1950) in examining the "psychology of human constructs", and the work currently being done in this area in Britain.

Work being carried out by Dr. Harry Osser (1978-1980) on the ways in which teachers observe and record the behaviour of students may throw useful light on our rating and observational procedures. Dr. Shipman's paper rightly emphasizes the value of a variety of observational approaches to assessing the child and the classroom environment in coming to understand children's progress or lack of progress. Thus we come to *Axiom 7: that teachers' estimates, suitably calibrated to standardize them, and classroom observations, should be added to test results in the effective assessment of children's performance.*

TYPES OF DISTRIBUTION

An issue related to reliability, validity, and effective assessment is that of the distribution of test scores. Do we look for a *normal distribution* of test scores in our results? No. This tells us nothing but that most children are clustered around the mean in performance. These results imply that the test items are inefficient in discrimination and are acting very much like a collection of tossed pennies in generating a "random" distribution of scores. A much more efficient distribution is the *rectangular distribution,* in which children's scores stretch from zero to perfect, with approximately equal numbers at each score level. This distribution has the maximum standard deviation possible, and is the most effective method of describing and classifying a normal population. Test items are likely to be very efficient. Indeed, the best procedure for obtaining a rectangular distribution is to develop a "peaked item distribution" (Lord, 1952; Cronbach & Warrington, 1952) in which efficient items are grouped in the median difficulty range (forty to sixty percent pass), with very few items at extreme low or high difficulty levels.

But if one wishes to identify and isolate specific groups, especially in developing a "diagnostic" test which will identify children with learning difficulties or special needs, the test distribution would best be planned to take a bimodal form, with the majority of children in one hump (the top scoring "normals" presumably) and the minority (low scores) in the other hump (the special needs).

Alternatively, the test score should be severely skewed, with a large proportion of children achieving high or perfect scores and a small proportion spread out finely across the whole scale of performance. This distribution would be like a "vernier" scale in making many fine discriminations between those children with lower performance levels or learning difficulties. The test could take on a "diagnostic" form, allowing one to identify failure or difficulty in particular tasks and skills.

The important issue is that the test distribution and operating characteristics of items (such as difficulty level and discrimination between different ability levels) should be chosen to meet the goals of the assessment procedure. Currently, it is likely that screening and identification techniques used by some boards of education do provide a skewed distribution, in which children of "normal" ability (those capable of coping with developmental tasks at levels appropriate to their age) score high on the instrument and children who need to be identified as developmental retarded, or failing to make progress, are identified by their low scores. However, it is not evident that such tests have been rationally planned to achieve maximum efficiency for their purpose, or that the items have been analyzed to ensure that they do discriminate well between children according to specific criteria. It is therefore important, in *Axiom 8, to note that the score distribution of the test instrument and operating characteristics of the test items should be planned and selected for maximum efficiency in meeting particular goals in early screening and identification or in comparison of children's performance.*

EFFICIENT PREDICTION

Reference has been made to Dr. Shipman's evidence based on studies of children followed up over several years. This casts much doubt on the classical concept of prediction and "identification" of need. There are a variety of other studies. A study carried out by DeHirsch et al (1966) used a large battery of language and perceptual tests (visual and auditory) at the preschool level to isolate children likely to have learning difficulties. A high level of predictive efficiency was claimed--for example, ninety-two percent of children correctly classified. This study confirmed the importance of visual and auditory perceptual and memory functioning in learning difficulties at the early school level. Similar studies by Satz and Friel (1974) produced similar results, but suggested that certain test items predicted later learning disability more effectively. One must be dubious about such claims in the light of the present discussion; it is unlikely that long-term prediction could be as effective as the DeHirsch study, for example, indicated. Furthermore, a large and cumbersome battery of varied functions was used, much larger and longer than the average practical screening/identification instruments, and requiring special knowledge or training to develop and administer in a research setting.

Earlier work (Pringle et al, 1966) on a large group of children in Britain, followed up from birth, suggested that tests and observations administered in the preschool years had a high degree of inconsistency over time, generating many false positives and negatives. Experience of screening/identification at the preschool and even early school level suggests that the measures appropriate at early age levels, which emphasize motor and perceptual skills, may have rather low direct correlations with later developmental skills and school progress, which depend more on symbolic and language abilities. Prediction over the short term at kindergarten level or later can be moderate to good, within the limits indicated by this discussion. A study done by Ontario's Carleton Board of Education (Wand, 1974) indicated that reading progress at grade two level could be reasonably well predicted from a battery of tests at school entry. Even so, this is with a significant proportion of misclassifications.

MULTI-STAGE ASSESSMENT

It would appear then that, firstly, the linear relationships and direct correlations assumed in classical predictions are not good methods of analyzing the complex, interactive, and reciprocal relationships found in following up children's progress in real life situations. Secondly, identification and assessment methods should attempt to describe and interpret *change in performance*, rather than stability of performance as such. And thirdly, a wide variety of effects should be observed, including the child's environment, his or her home background, the classroom situation and the teacher's interaction, as well as the child's own development.

It would also appear that early identification, or "developmental review" (to adopt Mr. Iain Davidson's terminology in this conference), should begin with screening, followed by more detailed and refined investigations planned to look at a smaller proportion of children or a specific aspect of functioning. This implies that identification should be multi-stage. It has the further implication that assessment should take place over a time span, which would allow the changes in the child to be observed, additional information gathered, and adjustments made to previous observations. Experience suggests that trial teaching and variation of program can be important aspects of the continuous assessment of children. We may therefore develop two final axioms: *Axiom 9: Assessment of performance should be multi-stage, permitting focus on more detailed aspects of children's performance and needs and/or selecting increasingly smaller groups for special assessment and attention; Axiom 10: Assessment should sample not only a variety of kinds of performance and sources of information at a given time, but also sample performance and change in performance over a prolonged period of time; that is, there should be continual probing and assessment guided by the outcomes of previous assessment compared with changes in the child's progress, rather than continuous assessment which is not practicable.*

It should be noted that problems of reliability, validity and prediction discussed here are even greater when classroom and other types of observation are used, and when there can be variation from observer to observer. The calibration of teachers' assessments and estimates, or the use of panel methods of monitoring and calibrating assessment, would appear crucial.

MODELS FOR SOUND ASSESSMENT

The ideas presented here seem to me to lead us in the direction of some specific theories. One is that based on "sequential analysis". Wald (1947; 1950), more than thirty years ago, presented a statistical theory, using the model of industrial quality control, in which behaviour or performance could be sampled and assessed to determine normal limits and permit unusual or abnormal variations to be detected, assessed and responded to. This was essentially a "feedback" model of statistical analysis and control rather than a static model of description and prediction.

A major theoretical guideline, I would suggest, is the Bayesian approach in statistics and experimental design. Bayes' "inverse probability" theorem was disregarded for over a century and a half, but is now the basis of a powerful new movement in statistical thinking.

Essentially, Bayes would suggest that we do not begin our approach to a problem with an empty mind and a "null hypothesis", as suggested in the classical Fisher (1958, 1960) and Neyman-Pearson (1933) theories. We begin with prior expectations in the form of prior probabilities from experience. These expectations can be quantified, however crudely, even if based on rather vague and apparently subjective judgements. By suitable experiment, we can obtain posterior probabilities and apply these, via the theorem, to correct and modify the *a priori* hypotheses. This is the basic inductive method, or a "feedback" approach in which experience is used to confirm or modify initial hypotheses.

To me, this presents the model of a good assessment or investigation: to make appropriate initial judgements or have some hypotheses on what is the state of affairs and how we are to proceed, and then to modify the hypotheses in the light of experience. In the clinical field, this would take the form of a "clinical-programmed" approach, in which hypotheses are used to guide the first approach to the investigation of the performance and problems of a person, and the ongoing data are used to check and control the next steps in investigation, in a flexible but organized series of responses to the problems as they emerge. This approach seems preferable to applying, at great cost, a whole battery of measures to the whole population and then calculating the results.

CONCLUSION

Comparison of the various "axioms" presented in the course of this paper would have implications for action such as the above. It would also support the conclusion that we must be prepared to make informed judgements, or even guesses, to establish "baselines" for the expected proportion of children with given types or levels of performance, as is done in clinical psychology or epidemiology rather than just gathering data without a rational goal or any idea of the size of the problem. I would, for example, be prepared to adopt as a baseline sixteen percent of children who are likely to have sufficient special needs to require adaption of program or special teaching, and within this group five or six percent with more or less significant handicap or evidence of "learning disability" or behavioural maladjustment to school situations.

Prediction in the sense of classical test and statistical theory is thus not the most effective or useful approach we can take. The arguments presented here lead to a cautious scepticism, and acceptance of the arguments for a "sequential" approach to identification and assessment, using a variety of sources and information, probably multi-staged and certainly spread out over time. Record keeping and evaluation are as important as identification batteries. The teachers' observations and estimates are as important as, or more important than, tests. Teacher training is an essential need.

Prediction is not clairvoyant guessing. But neither is determinism. The predictive approach, rather, is the ability to judge effectively and use prior information; to observe acutely and appropriately; to take into account the child's environment as well as his or her present status and his or developmental history; to make use of multiple sources of information (and as multi-disciplinary as is necessary); to initiate intervention and trial teaching as early as possible; and to continue over a period of time to adjust our perceptions of the child to his or her changing and multiple needs.

NOTES

[1] In perspective, what does a particular validity (predictive) or reliability (consistency) correlation coefficient tell us? What about the predictive/concurrent correlation between the Windsor Identification tests and teachers' estimates, of about .55 to .60? This looks reasonable. But the amount of "true-score variance" accounted for by a correlation coefficient is that correlation squared, that is, .6 x .6 or thirty-six percent. This means that sixty-four percent of the variance of the test is error or otherwise unaccounted for.

A correlation coefficient of near .8 (the relationship between the Windsor materials and the Smith-Francis tests) accounts for sixty-four percent of the true-score variance, leaving thirty-six percent unaccounted for. Similarly, with the internal consistency reliability estimates for these tests, at most .88, this would account for seventy-seven percent true-score variance. This obviously leaves considerable scope for individual variation, effects of change, practice, motivation, and other kinds of unpredictable "error" in our estimates of future performance, as based on tests of this length and efficiency.

[2] Factor analysis is a statistical technique for finding the underlying dimensions or factors in the associations among a group of tests or performances, e.g., "general ability", "verbal ability", "verbal fluencies", "spatial perceptions", etc.

[3] This follows from the fact that a test-retest correlation (reliability) cannot in practice be over .15 and is usually lower (.9 to .8 at best) in measurements repeated over a period of time.

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SOME ISSUES IN THE IMPLEMENTATION OF AN EARLY IDENTIFICATION PROCEDURE

Trevor Bryans

Many types of early identification programs are being currently developed in the United Kingdom, some of which are directly modelled on the Croydon Screening Procedures described in this article. Others have evolved in response to local needs. Attention is given in this article to some of the main issues and problems pertaining to the implementation of an early identification program.

The introduction of an early identification procedure represents a major shift of educational emphasis away from reaction to failure and remediation towards diagnosis, intervention and prevention of learning difficulties. As yet, this shift in emphasis has taken different forms as each education authority[1] attempts to meet local needs, but there are discernible trends at the practical level in this burgeoning area of early identification and intervention.

Epidemiological studies conducted in Britain during the 1960's and 1970's (Rutter et al, 1970; Shepherd et al, 1971) shattered clinical illusions by revealing that there were larger numbers of children with evident developmental, emotional or learning problems than had been previously thought. With the publication of the Government-commissioned *Warnock Report* (1978) on Special Education, educators are acknowledging that most children with special educational needs are in ordinary schools, and that ordinary schools have the responsibility of identifying and providing relevant education for this group of children.

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As Wolfendale points out in her paper,[2] this broadened base of special educational provision can only be achieved by a reappraisal of the role and function of ordinary schools and, more particularly, of class teachers, many of whom do not view with much enthusiasm the assimilation of new, wide-ranging and often highly specific skills in order to cope in enough depth with the special needs of some children.

So it is hardly surprising that in most early identification procedures the teacher is regarded as the most important resource (Stevens, 1978). The teacher is seen as the professional who must make relevant observations about children and their responses in school, because s/he is the only adult, apart from parents, who is in a position to effect change in children's lives. As Evans and Ferguson (1974) point out, the aim is to enable teachers to gain information about children which can be routinely collected in school so that appropriate educational action can follow.

The Croydon Screening Procedures described by Wolfendale (1976a) developed originally from concern felt about the numbers of children leaving school with poor levels of basic educational attainment. The working party[3] set up to investigate this phenomenon soon focused on what it believed were the central issues, namely that educational failure is often evident early in a child's school life and that it is seldom completely reversible. As a result, the working party recorded its view that testing numbers of children at the age of seven years or older was too late, for many children would have experienced too little success and too much failure by that stage. Furthermore, the results of screening at that age would only confirm what teachers already know about individually failing children.

THE CROYDON CHECK LIST

The Croydon Check List, an individual profile administered to all children aged around five years in their first term at school, was proposed as the first stage of a primary school screening procedure (see Appendix). Whilst it is not possible in this paper to provide the rationale of the nineteen items on the Croydon Check List, there now seems to be general agreement that the developmental areas which it covers, namely those of language, perceptual-motor processes, emotional and social development and response to learning situations, are the most important in the early years of school (Wolfendale & Bryans, 1979). Because the Check List is a first stage identification screening instrument for use with whole populations of children, it is, unlike some other assessment schedules, parsimonious and blunt, and does not aim to be comprehensively diagnostic. The choice of items represents an attempt to gauge children's developmental status and to link this with processes in the classroom. As can be seen in the Appendix, the items are clustered into the four sections outlined above.

About six weeks after entry to school the teacher fills in a Check List for each child by responding with a "yes" or "no" to each of the nineteen items. There are no descriptive categories for the teacher to then slot the total of "yes" or "no" answers into, and increasingly the use of the term "at risk" has been abandoned when applied to children about whom the teacher records more than seven or eight "no's". Rather the pattern of "yes" and "no" is seen as the starting point in providing relevant educational programs for any given child.

SCORING AND MEASURES

The use of measures such as the Croydon Check List raises a number of issues which require further discussion. The issues reflect doubt and misapprehension regarding the prevailing state of theory about early identification procedures and the present lack of hard information about early child development processes as well as how teacher attitudes, expectations, and practices affect how children learn and perform in school.

The scoring of early identification instruments is usually dependent on the appearance or non-appearance of certain behaviours which are assumed to be developmentally appropriate and therefore linked to the requirements of tasks. But this assumption is complicated by several factors, none of which are fully understood. Most learned skills, and academic skills in particular, do not appear to be uni-dimensional, but rather they are inter- and intra-active. For example, Loban's (1966) classic study showed that children with the best developed oral abilities in grade one were the best readers in grade six. In a study of the long-term effects of an intensive reading instruction program at infant age, Bryans (1979) found that after a period of two-and-a-half to three years from the end of this program, there was an evident general deterioration in performance. Whilst all of the children learned to read at a level commensurate with or above their chronological age at seven and a half years, by the age of ten years there was a tailing off in performance in both reading accuracy and comprehension. The issue is certainly wider than that of teaching young children to read. But as Stevens (1978) points out, early development to about seven years is characterised more by discontinuity of development than by continuity. For some children the discontinuity of development is so marked that they learn to perform school tasks which apparently demand the integration of sub-skills without ever having practiced or mastered these at an earlier stage of development, whilst other children fail at precisely this same stage even when they have had ample opportunity to prepare for it (Raybould, 1976).

The use of reading attainment tests as criterion measures[4] in validation studies of screening instruments such as the Croydon Check List highlights a basic difficulty, for reading achievement, although commonly used as a criterion measure, is only one of a number of measures which could be used either concurrently or predictively. But as has been noted above, individual patterns of performance are such that children with an identifiable difficulty in one area of development at five years may not necessarily have an evident difficulty in the attainment area sampled by the criterion measure either concurrently or predictively.

Using the Neale Analysis of Reading Ability (N.A.R.A) (Neale, 1958) at seven years as the criterion measure on a sample of 204 children, a correlation of .71 was established with the Croydon Check List administered on the same children when aged five years (Bryans & Wolfendale, 1975).[5] Wells and Raban (1978), in the S.S.R.C. project "Children Learning to Read", found that the correlation between the Croydon Check List total score at age five years and reading accuracy on the N.A.R.A. (Neale, op. cit.) at seven years was .68. The correlation with teachers' estimate of reading ability at seven years rose to .8.

Kingslake (1977) has produced a comparative study of various "on-entry to school" screening procedures. Its aim is to see which group of children is identified by each procedure as potentially "at risk" of educational failure. Five reception infant classes[6] (children aged around five years) formed the sample and each child in the sample was assessed on all of the procedures. These ranged from subjective assessments by the class teacher, teacher-marked check lists (including the Croydon; and the Stott Preliminary Screening,[7] Stott, 1978), reading readiness (Thackray Reading Readiness Profiles,[8] Thackray, 1976), batteries of traditional construct sampling devices (including the School Entry Test,[9] Sheppard, 1972; and Early Identification Screening,[10] Zeitlin, 1976), to a standardised procedure (Preschool and Primary Scale of Intelligence,[11] Wechsler, 1967). Extensive examination of each "identified" group has been made and correlations computed between these measures at or around entry to school and criterion measures of reading, spelling, number and shape-copying carried out at the end of each child's first year at school. In addition, a potential indicator of "at-risk" was developed from preschool developmental screening (Sheridan, 1975), this being made available by the health service for the five infant classes.

It is not possible here to adequately summarize the findings, but the results from Kingslake's study confirm the findings of other workers in the field of early identification (Lindsay, 1978; Wolfendale & Bryans, 1979). In general, correlations between the criterion measures of reading and the individual screening measures ranged from .62 for the Thackray Reading Readiness Profiles down to -0.1 for the Stycar Developmental Screening Measure. Overall, the teacher-marked check lists such as the Sheppard, the Zeitlin, the Croydon and the Stott (in that order) correlated significantly with all four criterion measures beyond the 0.001 level. The several developmental test battery materials either produced negative findings or else very low predictive validities.

Some explanation of the lower reliability and validity coefficients has been given already in the brief discussion above on young children's discontinuous development, and in the difficulty of choosing relevant criterion measures in validation studies. In addition, mention must be made of what has become known as "the paradox of prediction" expressed thus by Keogh and Becker (1973, p. 10): "Having identified a child at risk, the researcher is obliged to intervene, thus limiting examination of the long-term predictive validity of the instrument."

Apart from these statistical issues, there would seem to be a number of practical considerations in the choice of screening instrument. If the screening instrument is to be used by teachers, then it should not be unwieldy or time consuming even if group measures are being used, for very few teachers have the time for extensive scoring and elaborate interpretations of results. The data collected by the screening instrument should be readily available within the school (Evans & Ferguson, 1974) and the data should also be related to the goals and processes of the school. Screening should not be a remote exercise separate from the mainstream of the school curriculum. This latter point is strongly in evidence in the Kingslake study (cited above) which showed that the least reliable and valid predictions of school success were the general medical-developmental test batteries.

Another important issue which is merely mentioned at this point but discussed later in this paper is that of unanimity of perception and purpose on the part of those engaged in the screening exercise. It is important to have clearly thought out goals as to the purpose of screening, the action or intervention to follow, and the ways in which the success of the system can be evaluated.

IN-SERVICE IMPLICATIONS

This leads directly to the topic of in-service education and its place in an early identification system, which is discussed in more detail in Wolfendale and Bryans (1979), and is based upon the authors' experience with the implementation of the Croydon Screening Procedures. When an early identification system is proposed which is to include all children in a given local education authority, there is not only an immediate problem of coping with the large numbers of teachers involved, but in effecting the necessary attitude change on the part of those teachers whose initial training has been "norm-based" to prepare them for contact with children likely to respond to normal curricula. Such an emphasis on the needs of the majority, although essential, means that many teachers have little or no direct experience of how to deal with the large minority of children with special needs in ordinary schools. As a result, many teachers can neither conceptualize the issues nor initiate teaching strategies and programs which are most appropriate. Rather they have tended to invoke the deficit model to explain failure; that is, they tend to see a child's poor performance as intrinsic, rather than to take account of such factors as teaching style, curriculum content, and provision of resources.

If early identification screening is therefore to become policy, the local education authority needs to provide comprehensive in-service education which includes these elements:

- recapitulation of principles and processes of child development and the psychology of individual differences, practically based;
- origins and aetiology of behaviour and learning problems;
- assessment of learning difficulties in specific areas such as language, aspects of reading failure, or behaviour difficulties;

- forms of educational intervention and their organization;
- administration and interpretation of screening results; and
- opportunities for teachers to design, carry out and evaluate different types of intervention programs with individual children or small groups.

Three main types of in-service courses appropriate for urban areas have been used in Croydon with the aim of increasing teacher awareness about the objectives and techniques of early identification and intervention. They may be outlined as follows:

1. *Basic Induction Courses*

Each infant school within Croydon has a key teacher who holds a responsibility post for screening. The induction courses are held annually for head teachers new to the borough and for teachers who have recently taken up this key point. The main aim of these sessions is to familiarize these teachers with the rationale and use of the Croydon Check List as well as with subsequent stages of the Screening Procedure. A subsidiary aim of the sessions is to encourage the key teachers to discuss with their colleagues practical issues in administering the Screening Procedure and ways in which expertise within the school can be pooled to help individually failing children.

2. *Local School-Based Courses*

Groups of teachers from one particular area of the borough meet to discuss topics such as language intervention, and to exchange ideas on materials or teaching hints. Another type of school-based in-service is provided by advisory teachers from the reading and language centre who carry out short-term projects in infant schools by working directly with the staff of a school.

3. *In-Service Development*

There have been many in-service developments in the area of intervention arising from the screening procedures. Two of these are discussed in the next section of this paper under the heading of intervention. Other examples of this type, less explicitly controlled and monitored, have occurred where groups of teachers have met over a period of one or two school terms to report on their own work, trying out, for example, language programs or perceptual motor materials with young children. This type of practical workshop course has enabled a number of teachers to achieve success with children with whom they had previously failed.

From time to time a questionnaire is sent to schools to sample teachers' opinions on such issues as in-service training needs, materials and approaches. In this way the teachers feed back their opinions to a central source and keep advisory staff continually informed as to teachers' needs and perceived priorities for in-service work. Above all, the choice of in-service work will be determined by the need to introduce all teachers and support service personnel to the common theoretical and practical framework of the particular early identification and intervention model which has been chosen.

INTERVENTION IN CROYDON

A theoretical framework and summary of the concept of intervention is given by Wolfendale in her paper.[2] I wish here to outline some examples of intervention within Croydon, all of which have come about as a result of the screening procedures. Intervention in Croydon schools has been in two main areas, namely that of reading and reading development as well as in the developmental areas covered by the Croydon Check List. Because the later stages of the screening are concerned with reading, a large number of schools have made major changes in their approach to the teaching of reading.

In some cases, the information obtained from the screening has encouraged schools to either change reading schemes or the reading policy of the school. In a recent questionnaire to teachers on the value of screening, it was found that fifty percent of the teachers sampled had changed both attitudes and practice in the teaching of reading as a direct result of the screening procedure. Using their own check lists of sub-skills in number and reading, many schools and individual teachers have improved their recording systems to ensure that failing children do not go unnoticed.

But it has been acknowledged within the borough that the main efforts to intervene should be in the early years of school, before, as Bullock (1975) points out, the child begins to experience and therefore anticipate failure on a daily basis. The first local attempt to provide a format of help for the teacher to use with children identified as having difficulties was through a *Guidelines* pamphlet (Bryans & Wolfendale, 1973) which parallels the format of the Check List in presenting four main areas of development and functioning.

The speech and communication section of the *Guidelines* employs the tripartite model of the I.T.P.A. (Kirk et al, 1968),[12] Karnes Ameliorative Programme (n.d.),[13] and the Peabody Language Development Kit (Dunn & Smith, 1965).[14] Exercises and activities in this section cover the development of listening skills, use and understanding of words and concepts, flexibility of thought and expressive skills. The perceptual/motor section, placed within a developmental perspective, covers activities and exercises for the establishment of dominance, gross motor co-ordination, fine perceptual motor skills like scanning, hand-eye control, sequencing and visual discrimination. The section of the *Guidelines* which deals with emotional and social development outlines ways in which teachers can cope with and help those children manifesting behaviour and emotional difficulties, or poor adjustment to school. The main theme of the response to learning section is that many children need help in learning to learn, and ways in which this can be attained are offered.

The *Guidelines* have been used extensively by individual teachers and in many of the in-service workshops referred to previously. Many teachers have elaborated on the ideas provided by the *Guidelines* to meet the requirements and needs of their own classrooms.

Some of the intervention programs have conformed with the requirements and principles of research, with evaluation included as an important component. Wolfendale's (1976b) language intervention project was based in an infant school in Croydon. The main hypothesis was that structured intervention on a daily basis in a small group withdrawal situation could boost aspects of concept and language attainment. The program's content covered listening to stories with comprehension exercises, participating in action games, explaining general concrete and abstract concepts and other expressive skills. The short duration of the program (twenty-four sessions) precluded significant gains by the children, although statistical trends and teacher ratings indicated that gains had been made by the experimental group. An important conclusion from the study was that short daily intervention sessions can be carried out with minimal disruption to school routines.

This latter point needs further elaboration to avoid misinterpretation as a naive axiom. Whilst there is overwhelming support for the concept of early intervention, and whilst some of its parameters have been sketched (Hunt, 1969; Bronfenbrenner, 1976), it still remains true that there are no clear guiding practical principles outlining *how* intervention is to be done, and in particular what the role of schools is to be. As Evans (1979) points out, there is no "technology of intervention" at present, although there is a willingness to move from remediation to prevention.

Finding out what works, and with which groups of target children, is therefore clearly the next important step. Only then can the boundary between social as opposed to educational intervention be delineated, since it is now clear that some children are so economically and materially deprived that economic and social intervention is of greater importance. Although Pauli (1975) writes that education intervention is more effective with what he calls "proletarian children", the fact remains that we do not at present know the extent to which schools can accommodate and make changes in organization, personnel and curriculum approaches to prevent later educational and social failure--even with chronically deprived children.

The importance of teacher attitude in the expansion of the school's role in early intervention projects is clearly illustrated in the current small scale study reported by Wolfendale and Bryans (1979).

This project based in several Croydon infant schools is an off-shoot of the Croydon Screening Procedures. A group of twenty-eight children were selected by their poor performance on the Croydon Check List. A control group of children was also selected and matched on a pre-test battery consisting of the English Picture Vocabulary Test (Brimer & Dunn, 1962),[15] a Picture Language Scale, the Bristol Social Adjustment Guides (Stott & Maston, 1966),[16] the Neale Analysis of Reading Ability (1958), and the Wepman Auditory Discrimination Test (1973).[17] The aim of this long-term study is to observe the experimental group's progress through school and compare it with the control group. The experimental group is receiving strategies designed to improve learning responses in the areas of language, response to learning, and perceptual/motor attainment. Materials from the reading and language centre are lent out to individual teachers as they are required.

However, although first results of the study indicate gains by the experimental group, it was noted at the outset of the intervention stages that there was a lack of confidence on the part of the involved teachers when initiating and developing the necessary teaching strategies. It seems that support for individual teachers (and groups of teachers meeting together) is necessary to maintain confidence and incentive in carrying out projects of this nature.

The last example of school-based intervention is that of an intensive, small scale project involving six children in one class of a Croydon infant school. The study, conducted by the author and Wolfendale, aimed to identify six children who, on the basis of the teacher's ratings, were considered to be showing signs of incipient difficulty in terms of learning and adjustment to school. This group of children was at a "pre-referral" stage, in as much as their difficulties had not begun to show evidence in lowered educational attainments of reading and arithmetic. Comprehensive pre- and post-test assessments, as well as continuous observation and monitoring, were carried out as part of the program. The following were used in the assessment of the children: the McCarthy Scales of Children's Abilities (verbal sub-tests, McCarthy, 1972),[18] the English Picture Vocabulary Test (Brimer & Dunn, op. cit.), the Bender Visual-Motor Gestalt Test (Bender, 1946),[19] and the Croydon Check List and

Observation Sheets (Wolfendale & Bryans, 1979), including Language, Perceptual-Motor, Emotional-Social and Learning Description (see Appendix).

The hypothesis was that daily, structured intervention over a period of eight months on the basis of information obtained from the pre-testing would produce superior performance on the post-test measures as well as in classroom behaviour. Daily and weekly records were kept by the children's class teacher, who also carried out the program, so that modifications could be made to the program as it progressed. Specific teaching points were adhered to by the teacher during the program.

The preliminary data indicate that the six children who participated in the program improved significantly over the period of six months (Wolfendale & Bryans, 1980).[20] Many further analyses, both quantitative and qualitative, need to be carried out on the data from this study, but several preliminary conclusions can already be drawn, which endorse the main principles outlined by Kelsall and Kelsall (1971). Some of these are:

- developmental delays and inappropriate behaviours exhibited by some young children in areas such as language, perceptual-motor skills or learning styles are often so subtle in their manifestations that even quite experienced teachers do not perceive them unless their attention is focused on them;
- when the teacher is aware of these inappropriate behaviours and has clear teaching goals related to the present functioning of the children, then there is an immediate, observable improvement in the quality of children's responses in the small group withdrawal setting; the observed improvement is soon exhibited in the classroom;
- specific teaching points related to the teaching goal are essential in the small group setting, otherwise it becomes a small scale version of the normal classroom with children learning not to participate (see Wolfendale & Bryans, 1979);

- there are several advantages in using the class teacher in this type of small scale intervention: there is continuity for the children involved; the teacher can relate learning characteristics observed in detail in the small group setting to general classroom work; and the teacher develops his or her expertise in diagnostic observation and teaching, rather than relying on outside agencies to deal with it at a later stage when the problems are more evident.

EVALUATION AND RESULTS

In evaluating the success or failure of an early identification screening procedure, several linked criteria need to be employed. These will include outlining objectives, monitoring progress, reviewing methods used, and final assessment of outcomes which necessarily must be both qualitative and quantitative. Here, because of time constraints, consideration is given only to final assessment.

The limitations of reading tests used either as indices of educational attainment or as criterion measures against which to validate early identification devices have already been discussed. But as the reading tests are used in the later stages of the Croydon Screening Procedures, an analysis of the results they yield enables personnel involved to gauge in approximate terms the success of the earlier stages of the procedure, namely the effectiveness of using the Check List and the subsequent action it generates. It is evident from analysis so far that since the introduction of the Screening Procedure in Croydon, with its attendant in-service training and other back-up services, there has been a steady and sustained decline in the number of children with evident difficulties in reading.

Reference has already been made to the practice of sending out questionnaires to teachers to sample their opinion on issues connected with the Screening Procedure. Results from one of the most recent surveys indicated that teachers were overwhelmingly in favour of the

Screening Procedure as it exists at present. This is, in itself, a qualitative expression that the system is seen to be of practical benefit to teachers.

The professional judgement of teachers, advisors and local authority personnel must be considered from several aspects. A working party of head teachers, school inspectors (superintendents), advisory teachers and psychologists meets regularly to review all aspects of the Screening Procedure, including its effectiveness in those schools represented in the working party by their head teachers. In addition, working party personnel report back on examples of good practice and encourage dissemination of their findings.

CONCLUDING REMARKS

The day-to-day administration and operation of a screening procedure is a considerable task as Bullock points out, involving a large number of disciplines and professionals but, as the report states, "the results fairly justify the scale of effort required" (1975, p. 248). It is to be hoped that the implementation of a screening procedure in a local education authority may represent the first step towards the achievement of powerful social and educational intervention strategies for children with special educational needs.

NOTES

[1] The Local Education Authority (L.E.A.) is the equivalent of the Canadian school board level of organization.

[2] Readers are referred to Part One, "Early Identification and Intervention", by Sheila Wolfendale.

[3] The working party in Croydon consisted of ten primary and elementary principals, several advisory teachers, three superintendents, and two psychologists.

[4] Criterion measures are independent external variables or standards of judgement, believed to relate to the measuring instrument under consideration.

[5] Validity is concerned with what a particular test measures and how well it does so. Test validity is therefore usually expressed in terms of a specific criterion. The validity of a test refers, in this paper, to the consistency of scores obtained by the same individuals on different occasions.

A correlation co-efficient expresses the degree of correspondence between these sets of scores. If there were perfect agreement between the scores, the correlation would be +1.00; if there were perfect disagreement, the correlation would be -1.00. In practice, the correlations usually fall between zero and +1.00.

[6] The reception infant class is the youngest age grouping of children in a British primary school, and five years of age is the first year of intake.

[7] The Stott Preliminary Screening (Stott, 1978), for ages four-and-a-half to seven years, is a teacher-completed schedule serving as the first stage in the diagnosis of learning difficulties. It draws the teacher's attention to features of poor learning style and attitude to learning.

[8] The Thackray (1976) Reading Readiness Profiles, for ages five to six years, cover physiological, environmental, emotional, motivational, personality and intellectual factors. This inventory is specifically related to the acquisition of reading skills.

[9] Sheppard's (1972) School Entry Screening Test, for six year olds, aims at the identification of developmental delay or difficulties so that the teacher can then plan appropriate experiences. The sub-tests include dominance, perceptual forms, draw-a-man test, visual perception, and a matching task.

[10] S. Zeitlin (1976). *Kindergarten Screening: Early Identification of Potential High Risk Learners.* Springfield, Illinois: C. C. Thomas, as quoted in Kingslake (1977).

[11] The Wechsler (1967) Preschool and Primary Scale of Intelligence, for ages four to six-and-a-half years, is a standardised test of intelligence containing five verbal and five non-verbal sub-tests.

[12] The I.T.P.A. (Illinois Test of Psycholinguistic Abilities, Kirk et al, 1968), for ages two to ten years, is a standardised individually administered test designed to assess significant abilities and disabilities in psycholinguistic functions in young children.

[13] The Karnes (n.d.) Ameliorative Programme is derived from the I.T.P.A. materials (see Footnote 12), and is a language program, designed for three and four year old disadvantaged children.

[14] The Peabody Kits (Dunn & Smith, 1965) are designed for children with mental and language ages of four-and-a-half to six-and-a-half years, and six to eight years, and aim to stimulate oral language development. Twenty-four activities are used in daily combinations.

[15] The English Picture Vocabulary Test (Brimer & Dunn, 1962), for children five years to eight years eleven months, was designed to

assess levels of listening vocabulary. The child's task is to identify the picture to which the word refers.

[16] The Bristol Guides (Stott & Maston, 1966), for ages five to sixteen years, offer a method of detecting and diagnosing maladjustment, giving a comprehensive report of how a child behaves in school or home.

[17] The Auditory Discrimination Test (Wepman, 1973), for children five to eight years, gives an accurate assessment of the child's ability to discriminate amongst the principal phonemes in the English language.

[18] The McCarthy (1972) Scales of Children's Abilities, for children aged two-and-a-half to eight-and-a-half years, is an individual standardised test of ability. It yields scores in six main areas: verbal, perceptual performance, quantitative, general cognitive, memory, and motor.

[19] The Bender (1946) Visual-Motor Gestalt Test, for children four years old and over, requires the child to reproduce a series of designs. Departures from the originals are interpreted in terms of Gestalt laws of perception and organisation.

[20] Note that the English Picture Vocabulary Test (Brimer & Dunn, op. cit.) results proved unsatisfactory because of the inconsistency of scores obtained by the children tested on it. On the McCarthy Scales of Children's Abilities, the children's post-test verbal scale index scores showed a mean gain of 16.5 scaled score points--a twenty-five percent improvement in terms of measurable performance on the test. Similarly, the children's performance on the Bender Test also improved significantly. Both the gains on the McCarthy Scales and the Bender test were significant at the .05 level on the Wilcoxin Matched Pairs Test (a non-parametric statistical test designed to give information about the direction and magnitude of differences within pairs of scores).

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London Borough of Croydon--Check List Score Sheet

Appendix, T. Bryans

SPEECH/COMMUNICATION	PERCEPTUAL/MOTOR	EMOTIONAL/SOCIAL	RESPONSE TO LEARNING SITUATIONS
1.–5.	6.–10.	11.–15.	16.–19.

1. Is the speech mainly free from infantile substitutions?
2. Retains and transmits simple messages.
3. Listens to stories with interest.
4. Organises thought to narrate experiences.
5. Attempts to describe and discuss his/her environment.
6. Able to manipulate and understand the use of simple tools and constructional toys.
7. Draws/paints recognisable objects.
8. Can reproduce shape (a).
9. Can reproduce shape (b).
10. Can reproduce shape (c).
11. Receptive to new experiences.
12. Integrates easily with his/her peers in learning situations.
13. Forms appropriate relationships with his/her peers.
14. Forms appropriate relationships with his/her teachers.
15. Confident and self-sufficient.
16. Eager to learn.
17. Can persist at a task.
18. Can attend solely to the task in hand.
19. Given freedom of choice is able to pursue a learning task.

TOTAL NUMBER OF "NO" ANSWERS

FORMAT
2

ENTER Y = YES N = NO

CHILD'S NAME

CHILD'S NUMBER	DATE OF BIRTH	DATE OF ENTRY	B or G		NEALE READING AGE

B or G
B = Boy
G = Girl

TEACHER'S COMMENTS

THE EXPLANATORY NOTES FOR THE CROYDON CHECK LIST ITEMS

Item 1--Is the speech mainly free from infantile substitution?

In this statement we are asking the teacher to assess the child's level of maturation as shown by his/her speech, and the extent to which s/he can be understood by adults and other children. For example, children still using baby words like "boom-boom" "gaa-gaa" or short sentences like "me go ta-tas" are still fixated at an earlier emotional stage, or else are in need of a more appropriate language model.

Item 2--Retains and transmits simple messages

Here we are asking the teacher to assess the child's involvement in using language in day-to-day situations. For example, "go and ask Mr. Brown if it is indoor play today" or "can you please ask Miss Smithers for the blue chalk" would require the child to listen and learn the message, articulate it, and act accordingly.

Item 3--Listens to stories with interest

Most children are fascinated by stories, and become very involved in their content, across a wide range of themes and characters. The ability to listen to stories is an important skill because it incorporates features of the communication process such as attending to, understanding sequences of information, and using these in other contexts.

Item 4--Organises thought to narrate experience

An example of this would be a child telling teacher that s/he had a new pet at home. In general, we are drawing attention to the child's ability to abstract pieces of information and retain them over time, so that it can be recalled later, in context.

Item 5--Attempts to describe and discuss his/her environment

This item deals more with the child's immediate setting like the classroom. Does s/he notice changes in the environment, is s/he quick to describe things as s/he sees them, and does s/he sustain a simple conversation about these?

Item 6--Able to manipulate and understand the use of simple tools and constructional toys

This item requires the teacher to judge whether or not the child is able to carry out such activities as cutting with scissors, building with Lego, or Sticklebricks. S/he will also be looking at whether or not the child can settle creatively to activities.

Item 7--Draws/paints recognisable objects

By the age of about five years, most children can draw or paint everyday objects such as a house, a tree, or a man. These should be easily recognisable by the teacher.

Items 8, 9, 10--Can reproduce shapes

The child is required to copy three shapes: the diamond, the circle, the square, with crossed diagonal lines. The three items have bearing on aspects of reading skill like visual discrimination, scanning, relation of parts to wholes, position in space, shape-closure, continuous flow of movements and proportion. From five year olds, perfection is not expected, but if a child's attempts approximate within the norms of acceptability, then the signs are that it is a skill that is still being developed.

Item 11--Receptive to new experiences

The school routine requires children to be flexible in adjusting from one routine or activity to another. Many children are upset by change and may show in their individual ways the extent to which they can, over time, accommodate the requirements of the learning process, the aims of the teacher, and the school as a social institution.

Item 12--Integrates easily with his/her peers in learning situations

This item aims to gauge the degree of co-operation that children have with each other in small groups. Some children disrupt small group work by over-reacting or demanding too much attention from other group members, so that the effectiveness of the learning situation is reduced.

Item 13--Forms appropriate relationships with his/her peers

This item gives the teacher the opportunity to observe the child's social strategies and how s/he tests with other children in a wide variety of social situations in school.

Item 14--Forms appropriate relationships with his/her teachers

Well adjusted children usually seek adult attention when they require re-direction. However, many children are either excessively demanding of teacher attention, or else actively work to avoid making contact with the teacher. Both of these extremes usually work to the detriment of the child's relationship with his/her teacher. The onus is on the teacher to be aware of the reasons for the child's behaviour, and to act sensitively.

Item 15--Confident and self-sufficient

The teacher wants to record the extent to which the child is able to be self-reliant and self-generating, and able to spend periods of time on his/her own or with his/her peers without resorting to behaviour which demands constant teacher intervention.

Item 16--Eager to learn

The child's level of motivation is based on prior experience and opportunity of learning through play. Demands made by school and the child's expectation of it, will also determine his/her interest and involvement in learning.

Item 17--Can persist at a task

The mastery of many classroom skills only comes with repetition and persistence. In this way, errors are gradually eliminated and the skill, whether it be writing, copying, Lego, or drawing, is refined.

Item 18--Can attend solely to the task in hand

The three features of learning style assessed by this item are the child's level of distractibility, selective attention and concentration.

Item 19--Given freedom of choice, is able to pursue a learning task

Here the teacher is being asked to assess the ease with which the child has settled into the classroom learning routines, choosing activities for him/herself. The child's ability to select appropriate tasks will, of course, depend much on his/her preschool experience, but some children will need help in deciding.

THE DEVELOPMENT OF A SCREENING PROCEDURE FOR AN EARLY EDUCATION PROJECT: THE PEDIATRIC EXAMINATION OF EDUCATIONAL READINESS (PEER)

Judith S. Palfrey, M.D.

During this conference, we have been discussing various aspects of preschool identification. In Brookline, Massachusetts, over the past five years, we have been involved in developing a formal observation system to be administered by health personnel assessing pre-kindergarten children. The Pediatric Examination of Educational Readiness is being analyzed currently as part of our work at the Brookline Early Education Project. BEEP is a joint venture of the Public Schools of Brookline, Massachusetts, and the Boston Children's Hospital Medical Center. The program, funded jointly by the Johnson Foundation and Carnegie Corporation of New York, has been designed to test the hypothesis that it is of benefit to a community to sponsor a program of early identification and intervention through its public school system.

The inspiration for BEEP was the observation in the early seventies of the Brookline Superintendent of Schools, Dr. Robert Sperber, that children were entering kindergarten with readily identifiable problems.

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As Dr. Bergman of the Ontario Ministry of Education pointed out yesterday, there are children who come to school for the first time, and as they walk off the school bus, it is apparent that there is a problem--perhaps with vision or hearing or behaviour--yet the problem has not yet been identified or dealt with previously.

Dr. Sperber felt that since this was the case, there ought to be a way to identify and possibly treat these children prior to school entry. Since his view was consistent with what was occurring in early education at that time and since many policy-makers felt that early identification and intervention ought to receive commitment of research, time, and money, the school system took on the responsibility of early education. In Brookline, this meant starting three months before the children were born.

At its inception, the BEEP program was unique in a number of ways. It was the only longitudinal early education project that followed children from birth into school. It was, at the time, the only project of its kind to be managed directly through the public schools. Currently, the American mandate under Public Law 94-142 (1977) is pushing more and more towns and cities to consider early education projects. It is likely, however, that most of these will be designed for identified handicapped children. In contrast, BEEP was designed for all children within the town of Brookline. BEEP was predicated on the concept that parents are the educators of their children. Therefore, parental involvement in every aspect of the program was encouraged.

The first children entered the BEEP program as newborns in 1973. At that time, it was recognized that entry into kindergarten would be a major outcome point to determine if the early intervention had made any difference, to see how many children had been identified and if identification had occurred accurately before they entered school. As the project was being developed, the diagnostic staff searched the literature for preschool screening instruments to use as part of the battery for entry into kindergarten, and found none that satisfied the needs of the project. It was decided, therefore, that a screening instrument should be designed for use within BEEP. It is interesting now to review the screening literature and to recognize how many of the screening tools had their inception at much the same time for much the same reasons. The instruments take a long time to develop, and many of them are as yet in an intermediate stage with much of the data still incomplete.

There was a second important motivation in the development of the Pediatric Extended Examination of Educational Readiness (PEER). We wanted to assemble a comprehensive preschool assessment which could be performed by health personnel.

At BEEP, we have been very interested in the role of medical personnel in developmental assessment. We are convinced that physicians are spending considerable time pursuing developmental issues, and we are equally convinced that they are, by and large, poorly prepared to do this, and do not have available to them the tools necessary to perform adequate assessments. Both a recent survey of New England pediatricians (Shonkoff et al, 1979), as well as the American Academy of Pediatrics nationwide survey (1978) have confirmed this perspective, and have indicated that physicians themselves feel unprepared to respond to increasing parental interest in developmental issues.

Pediatricians do routinely see children for a preschool visit in the United States. In part, this is because booster immunizations are given at this time. But in large part, school entry is seen as a major transition between infancy and childhood and it is viewed as a natural time for a routine check-up. The number of new physical findings which are identified on this routine check do not really justify the effort, but the additions of screening for vision, hearing, and developmental deviations do make the effort worthwhile. The Pediatric Examination of Educational Readiness (PEER) can be perceived as a kind of developmental stethescope--a procedure which allows the health care provider who is seeing the child entering kindergarten to look at the child's functional abilities as well as at his or her physical status.

The developmental portion of the PEER has been administered both by physicians and nurses. In the school health office or a busy practice, the nurse may be the appropriate staff person to perform developmental tests. At BEEP, we have found that the nurse can play a very active role in early identification procedures and is often the best person to facilitate the coordination of follow-up with the schools.

The PEER is a comprehensive evaluation which includes a physical examination, vision and hearing tests, parent questionnaires and a formal developmental assessment. The developmental portion of the PEER is not an IQ test and, in fact, no score is generated, so it is impossible to fail. Instead it is designed to draw an overall picture of a child's functional abilities, and, when possible, to generate some hypotheses about the child's style.

The eight developmental areas assessed by the PEER are:

1. *Gross motor function.* The child's ability to walk on his/her heels and toes, stand on one foot, walk a tandem gait, and to move his/her arms are assessed. The examiner also looks for signs of neuromotor maturity.

2. *Fine motor function.* Pencil grasp and the ability to manipulate small objects are observed. Finger "exercises" are also analyzed for signs of symmetry.

3. *Visual motor perception.* The child's ability to discern differences among shapes is studied.

4. *Visual motor integration.* The child is asked to copy drawings and block designs.

5. *Receptive language.* Throughout the assessment, the examiner notes the child's ability to decode instructions. Several specific tasks address the child's ability to handle a series of commands, e.g., "put the pencil on the chair, go to the door, come back here, give me the block and sit down".

6. *Expressive language.* The child's own language is listened to carefully and several questions probed for his/her knowledge of vocabulary.

7. *Dressing and undressing.* A systematic observation of these common, learned complex acts is included with emphasis on how independent, thoughtful and organized the child is.

8. *Attention-activity.* The child is observed for impulsivity, attention, distractibility, movement and cooperation.

For each item on the PEER, the observer must make three decisions: (1) was the item performed at developmental level; (2) what was the processing efficiency (for example, did the child take a considerable amount of time, did s/he use a reasonable strategy); and (3) were there any indicators of neuromaturational lag? With these three observations on the various areas assessed, the examiner can determine at the end of the session what strengths and weaknesses this child manifests, and can often create a profile for the parents which rings true to them about what they have seen over and over in their child.

Over the past four years, 386 children have been tested using the PEER. The testing has been done in the summer prior to kindergarten entry. Each year there have been eight to ten referrals to the special education department of the Brookline schools. In other words, about eight percent of children have stood out in one way or another. In addition, we have mentioned to six to ten parents each year that it would be well for them to ask for an early conference with the school teacher in late September or early October, to check on their child's progress. Occasionally, when questioned directly, we have confirmed parents' observations that their child did not appear "ready" for kindergarten and perhaps the school must be alerted to adapt its program to the child.

Previously, we have shown correlations of the PEER findings with the McCarthy Scales of Children's Abilities, which is a standardized psychometric instrument (see McCarthy, 1972; Kronstadt et al, 1977; and Oberklaid et al, 1978). Currently, detailed analyses are being performed to correlate PEER results with what actually occurs in the classroom. For each of the areas tested, about ten percent of the children are being "flagged", and this seems a reasonable cut-off. Preliminary results show that the correlation between "flags" and kindergarten performance is very high. The children's teachers (who were unaware of the PEER findings) were asked to rate the children on social and mastery skills in the fall and spring. We now have clear indication that those children having difficulty on the PEER are the very children having difficulty within their classrooms (Levine et al, 1979). This high correlation is a major step forward in terms of predictive ability.

It has taken nearly six years of testing and modification to bring the PEER to its current form. The results from our present analyses are encouraging. The PEER seems to identify strengths and weaknesses and help us draw a profile of a child for his or her parents and teachers. Because the PEER is a comprehensive test tapping physical status, history of development and behaviour, developmental tasks, vision, and hearing, at the end of the forty-five minutes spent with the preschool child, the examiner has a broad picture.

The utility of such a systematic observation will not be determined for some time. Questions remain: Will screening programs be able to devote forty-five minutes to one child? (Less time means that important developmental elements may not be included.) Will physicians in their offices want to perform such tests? Is the summer prior to kindergarten too late for early identification? Will the information gained from such assessments be of real benefit to teachers? How predictive are such observations? (For example, will some findings persist into second and third grade?) Are the findings likely to be self-limited anyway?

At the Brookline Early Education Project, our task is to pose these questions and attempt to answer as many as we can. A long range study of the children tested on the PEER includes the kindergarten teacher observations mentioned above, as well as second grade evaluations. The answers to many of the questions will come only after years of experience with systems such as the PEER in communities throughout the United States and Canada. Ontario is about to take on preschool identification. It will be wise for programmers to build in careful evaluation of their procedures--whether they be formal screening assessments, parent questionnaires, or teacher observations--so that five to ten years from now, questions regarding the relative worth of the procedures can be answered.

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EARLY IDENTIFICATION AND INTERVENTION IN SEVEN ONTARIO SCHOOL BOARDS

INTRODUCTION

The individual board programs summarized below are examples of the variety in approach to implementing early identification procedures in the province of Ontario. The summaries are based upon workshop presentations recorded during the Conference. In several cases, however, transitional or experimental programs have been modified since that time, and readers are advised to write directly to the boards for updated details of specific procedures or programs.

HALTON'S EARLY IDENTIFICATION STRATEGIES,

HALTON BOARD OF EDUCATION

Presentation by Ms. Lorna Scott, Assistant Coordinator of Primary-Junior Special Education, and Mr. Ronald Chapman, Superintendent of Special Services, Halton Board of Education, 2050 Guelph Line, P.O. Box 5005, Burlington, Ontario, L7R 3Z2

History: - Halton's program was derived from a study project initiated in 1970 designed to assist in the identification of children with learning disabilities.

- Its original purpose was to develop a system of identifying "at risk" children so that program changes could be initiated in a preventive fashion.

Orientation: - All children are screened, and the program includes from "at risk", through to gifted.

- Emphasis also includes how the child proceeds through given tasks, how the child and teacher interact, and how the child interacts with peers.

- In addition to the specific tools used, the emphasis is on ongoing teacher observation and ongoing assessment.

Time of screening: - Fall of kindergarten; delayed entry.

Procedures: - (1) prior to registration, children come to school for an orientation to kindergarten in the spring; the public health nurse also administers the Denver Developmental Screening Test to each child, and shares the information with the teacher.

- (2) In the fall, home visits are made by the teacher (voluntary on the part of both teachers and parents) to administer two assessment tools, a Developmental Profile including general background, social, and affective information, and a General Information procedure which includes screening language, numbers, environmental concepts, thinking skills and other facets.

In-service: - In-service procedures include spring workshops, which are particularly geared to introducing the procedures to new teachers, as well as facilitating discussion with more experienced teachers. There are also two to three additional in-service workshops throughout the year to examine curriculum and program adaptations of relevance to the children screened.

Other resources: - Teachers make use of the board's eight primary-junior consultants who can offer further diagnostic assessment as required as well as assistance in devising individualized curriculum plans.

- Halton Board of Education has developed a Handbook containing the assessment procedures as well as programming suggestions.

Records, transition: - Teachers record conversations with nurses, children's responses to assessment procedures, and classroom observations on summary sheets which are kept with the teachers, and are used as aides in developing programs.

- Selection is made of file materials of current relevance, and these are passed on to grade one teachers. Such a selection avoids outdated or labelling kinds of information being retained on file.

Parent involvement: - In the spring, prior to registration, parents attend a meeting where all the early identification procedures and objectives are explained.

- Following the (non-mandatory) home visits, parents attend a program meeting where the principles behind individualized programs and curricula are explained.

- Individual parent-teacher meetings occur in the fall in lieu of formal report cards, which are not issued until the spring.

LAMBTON EARLY IDENTIFICATION PROCEDURES, LAMBTON COUNTY BOARD OF EDUCATION

Presentation by Ms. Isabell Carter, Primary Consultant, Lambton County Board of Education, 200 Wellington Street, Box 2019, Sarnia, Ontario, N7T 7L2

History: - In 1977, a pilot project was conducted in four Lambton schools, and was evaluated by parents, teachers, administrators and the Health Unit.

- In 1978, five other Lambton schools joined the project, which now included identification of gifted and talented students, expansion of assessment services beyond the kindergarten year, and modifications regarding the Health Unit's rôle.

- In 1979, expansion of the program to all elementary schools in Lambton took place and included in-service preparation and ongoing program evaluation.

Orientation: - The program attempts to assemble an information base to help teachers adopt or adapt strategies to meet the needs of kindergarten children entering school in September.

- There is emphasis on close cooperation between parent and teacher.

- Procedures are not directed at predicting failure or labelling, and use developmental principles (e.g., Piaget, Erikson) with emphasis on individualization.

Time of screening: - Senior kindergarten; delayed entry.

Procedures: - There are four components: (1) parent involvement; (2) health status, including vision and hearing; (3) identification of educational needs prior to kindergarten through classroom observation and use of a modified Windsor program; (4) follow-up activities and programming as needed regarding emotional, social, physical and intellectual development.

In-service: - Workshops have been developed for three groups: (1) administrators, including principals and vice-principals; (2) school secretaries who assist in the pre-registration contact with parents; (3) kindergarten teachers, who receive two full days of workshops.

Other resources: - Personnel from the Health Unit, who conduct the vision and hearing screening, and all the necessary health follow-up;

- A supplemental activities handbook is available for the teachers.

Records, transition: - Anecdotal report cards are used for the first two kindergarten terms, and a very specific checklist style of report cards for the third term; kindergarten and grade one teachers hold conferences at the end of June to pass on information and individualized programs.

Parent involvement: - Information about the program is provided prior to registration during a parents' meeting held in the spring; pre-registration visits provide the school with preliminary social and health information; education and health assessment interviews with the teacher take place in September; and information is provided regarding screening results and program in parent-teacher interviews and report cards.

OTTAWA'S EARLY IDENTIFICATION INVENTORY OF CHILDREN'S LEARNING NEEDS, OTTAWA BOARD OF EDUCATION

Presentation by Dr. Evalene Thom, Director of Special Education, and Ms. Adele Clark, Teacher Diagnostician, Ottawa Board of Education, 330 Gilmour Street, Ottawa, Ontario, K2P 0P9

History: - Program and research originally started in 1969 to identify children whose difficulties would interfere with learning.

- Additionally, background research was conducted regarding general characteristics of young children, comparisons of recognized early identification programs, and surveys of relevant developmental activities.

- These factors combined and evolved into the early identification program following support from the board and discussion and consultation with principals and teachers on how to best respond to the individual needs of all children.

Orientation: - In response to research and consultation, guideline descriptions were developed to provide a non-deficit focus to identification and intervention.

Time of screening: - Junior kindergarten, in June.

Procedures: - Four areas are assessed by the teacher: language, behaviour, skill development, and attention factors. Comments regarding other areas are also completed by the teacher regarding health factors, attendance, previous schooling, other languages, backgrounds, creativity, and giftedness. Test batteries are then selected as needed to follow up specific concerns.

Other resources: - Individualized programming is assisted through provision to teachers of developmental activities booklets, e.g., "Language Development in the Primary Classroom".

- Special education teachers offer teachers programming assistance including enrichment; social work staff provides liaison between home and school.

Parent involvement: - Several pilot projects have been initiated, and include parent discussion groups which have focused on specifying what the parents want the school to provide for their children, and how this may best be achieved.

- The board's research component is particularly interested in this aspect because of parents' increasing comfortableness with the school and the related benefits to the children in their preschool programs.

PEEL EARLY IDENTIFICATION SURVEY,
PEEL COUNTY BOARD OF EDUCATION

Presentation by Dr. Robert King, Director of Special Education, Dr. Deborah Weiss, Early Identification Teacher, Ms. Shirley Werry, Early Identification Program, and Ms. Joan Noyes, Special Education Resource Teacher, Peel Board of Education, 73 King Street West, Mississauga, Ontario, L5B 1H5

History: - In 1975, a pilot project began which utilized specialized staff--teachers' aides and early identification teachers.

- A costing review of this approach showed specialized staffing to be prohibitively expensive; an alternative plan was devised which called for the deployment of eleven early identification teachers and one coordinating early identification resource teacher.

- The board has developed a plan to phase in the program to all elementary schools within three years.

Orientation: - The program aims to bridge the information and planning gap between the preschool years and school experience through increased contact with parents, the Day Nurseries Branch of the Ministry of Community and Social Services, and other appropriate preschool resources.

- It is also regarded as important to share information between kindergarten and grade one, and to provide assistance in devising program plans.

Time of screening: - Senior kindergarten, at the end of first term.

Procedures: - There are three possible components: (1) a social history and health questionnaire completed by the parents; (2) the kindergarten teacher applies Peel's developmental assessment, which looks at physical, perceptual-motor, social-emotional, speech and language, and cognitive factors. The classroom teacher, the early identification teacher, and the principal meet to discuss the assessment results, possible program and diagnostic suggestions; (3) the early identification teacher completes in-depth testing with a small number of children, again followed by a conference and program suggestions.

In-service: - The board provides local in-service programming for kindergarten teachers who are trained by the early identification teachers at local field offices; large centralized training sessions are avoided.

Other resources: - A handbook of activities is made available to teachers, as well as a handbook emphasizing enriching home activities, made available to parents.

Records, transition: - Following screening, program ideas are recorded on individual student program sheets, and copies of the program are kept by the classroom teacher, by the early identification teacher, and by the school office.

- Regular communication with parents is regarded as important; parents can see the screening tests and program plans.

- At the end of the school year, conferences are held so that kindergarten teachers can pass on records and information to grade one teachers.

TORONTO'S EARLY IDENTIFICATION AND DEVELOPMENTAL PROGRAM, TORONTO BOARD OF EDUCATION

Presentation by Dr. Edward Brown, Coordinator of Student Services, Dr. Ronald Skippon, Chief Psychologist, and Dr. Marjorie Perkins, Psycho-Educational Consultant, Toronto Board of Education, 155 College Street, Toronto, Ontario, M5T 1P6

History: - In 1967, a five-year mixed service and research project was initiated, originally to identify the "at risk" population; by the time the project was completed, over 25,000 children had been screened.

- The program gradually shifted from an examination of special education children to provision of relevant information to teachers of all children.

Orientation: - The Toronto board's program stresses a preventive approach and is regarded as a continuous process of consultation, re-assessment and review.

- Developmental data are of importance, and information is gathered regarding cognitive, social, emotional, sensory, perceptual, expressive and readiness levels.

Time of screening: - Early in grade one for the majority of schools, although teachers/schools may request kindergarten screening.

Procedures: - No standard test package is used. Instead, individual and group measures are selected in planning sessions which involve the psycho-educational consultant, principal and grade one teachers at each school.

- All children are observed and rated by the teacher and consultant, and twenty-five to thirty percent of these children will complete secondary screenings with the consultant.

- The screening is then followed by formal interviews between the teacher and consultant in order to develop curriculum plans; a curriculum consultant may also attend to provide additional resources.

- More in-depth diagnostic testing may be recommended for children who appear "at risk", following the obtaining of parent permission, and special program modifications or community referrals are made as required.

Records, transition: - The psycho-educational consultant prepares a detailed summary statement for each child, and discusses it with the teacher, curriculum consultant and school nurse.

- Screening data are kept on file with Psychological Services office, and not recorded on the Ontario School Record.
- As the child advances, information is passed on between teachers.

Parent involvement: - A letter goes to all parents explaining the purpose of the screening program and noting that the child's participation is not mandatory.

- Parents can request information or formal reports.

Other procedures: - Screening programs are being developed for older grades (e.g., grades five and six) to assist in placement in senior school classes, to help in the identification of giftedness, etc.

WINDSOR EARLY IDENTIFICATION PROCEDURES,
WINDSOR BOARD OF EDUCATION

Presentation by Ms. Elaine Cline, Consultant, Primary Department, and Mr. Willis B. Glenn, Superintendent of Program, Windsor Board of Education, 451 Park Street West, Box 210, Windsor, Ontario, N9A 6K1

History: - In 1970, Windsor's Special Education Department arranged for kindergarten early identification, and developed multidisciplinary involvement in four schools by 1971.

- From 1972 to 1974, the Ontario Ministry of Education funded the research project as other schools phased in.

- In 1976, the Windsor Early Identification Project Report was published, and Ministry of Education funding continued, with the stipulation that methods and procedures developed must be made available to other interested boards.

- By 1978, thirty-one schools in ten other boards in four out of nine Ontario regions were utilizing Windsor's program.

Orientation: - The program emphasizes a teacher-child centered approach, supported by medical and social data provided by the parents.

- The program is seen as a gradual process enabling the adaptation of curriculum and individualization of program as soon as possible in a child's school career.

- Continuing re-evaluation of the program is regarded as important.

- There is much emphasis on the school's rôle as communicator in keeping parents informed of their children's progress.

Time of screening: - Senior kindergarten, delayed entrance; several components are applied toward the end of the kindergarten year--e.g., reading readiness.

Procedures: - There are four inter-related components, which include: (1) parent involvement; (2) health status, including hearing, vision and speech; (3) identification of educational needs of each child entering kindergarten; (4) follow-up on identified problems, including utilization of newly developed supported activities which are related to the areas of development screened.

- The teacher uses a kit to conduct the educational assessment in colour recognition, receptive and expressive language, auditory association, and math skills; scores in each area are converted to a five-point rating scale which is compared to the child's age, preschool experience, attendance, and behavioural characteristics (e.g., passivity, overactivity, self-esteem, attention, adjustment); programs are developed in conjunction with a primary consultant.

- The pre-registration visit to the school in March (handled by school secretaries) may conclude in referral to a summer Head Start program where such resources are available; the September visit allows parents to provide a social history of the family as well as a health history of the child.

Records, transition: - Records are kept with the teacher and are compiled immediately after every interview; records also include the checklist with scores in each area, the rating score, anecdotal reporting, and ongoing analysis.

- Information is passed on to the grade one teacher via discussion, written forms, and continuing contact with the primary consultant.

Parent involvement: - In addition to the pre- and registration interviews, parents are informed of the teacher's observations, and if interested, are provided with steps they can take to assist their children at home.

- Group meetings and hand-outs are also arranged for the parents, and public relations is seen as an important part of the early identification process.

WINDSOR SEPARATE'S SCHOOL READINESS TEST,
WINDSOR ROMAN CATHOLIC SEPARATE SCHOOL BOARD

Presentation by Dr. Gabriel Telegdy and Mr. Maurice Daigneault, Psychologists, Windsor Roman Catholic Separate School Board, 1485 Janette Avenue, Windsor, Ontario, N8X 1Z2

History: - Prior to the program's operation, research was conducted to develop a program which established validity. The study was published in the *Journal of Psychology in Schools.*

- The program has been in operation in all the board's schools since 1975.

Orientation: - The program aims to predict success in grade one and to prevent difficulties from occurring.

- It is regarded as a cooperative venture utilizing school administration, staff, and a variety of community services such as psychologists, social workers, speech pathologists, and public health nurses.

Time of screening: - Toward the end of the senior kindergarten year.

Procedure: - There is a three-step screening, including: (1) vision and hearing checks by public health nurses; (2) a very simple teacher rating to indicate whether a child's global functioning is markedly problematic, mildly below average, average, or above average; (3) the School Readiness Test, administered by the board's psychologists when its necessity is indicated by a teacher's screening (usually all categories except gifted).

School Readiness Test: - The procedure was developed by Telegdy and Daigneault by selecting and validating sections of other tests, and subsequently developing norms of relevance to the board's population.

- The test consists of twelve subsections which take only ten minutes to administer; the test is scored by secretaries who have been given training, and the results are then reviewed and interpreted by the board's psychologists.

- The psychologists record their comments (not the scores) on summary sheets which are passed on to the teachers.

- The test is found to be predictive of academic success in grade one, and valid for all socio-economic groups.

Records, transition: - The psychologists' recorded comments are forwarded to the schools, mental health services and any other involved parties.

Parent involvement: - Parental consent is obtained prior to the administration of the School Readiness Test.

THE WINDSOR EARLY IDENTIFICATION PROJECT REVISITED

Dr. Kenneth G. O'Bryan

OVERVIEW OF THE PROJECT

A multidisciplinary project recently carried out in schools of the Windsor Board of Education resulted in the development of a statistically reliable method for identifying five year old kindergarten children's problems that could affect their optimal educational attainments in school.

The research, funded by the Ontario Ministry of Education, was conducted over a four-year period with the results published in the 1976 report of the Windsor Early Identification Project (O'Bryan, 1976). The research led to the identification, early in the kindergarten year, of a substantial number of children who were either low or high performers on skills that had been judged as essential to learning in school.

The involvement of educators and health personnel in the study aided the research and also made possible the development of follow-up procedures. The results of these procedures were, however, not part of the original research endeavour, but form the basis of the current paper.

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The Windsor approach consists essentially of four inter-related components--parent involvement, determination of each child's health status, identification of the educational needs of each child on entering kindergarten, and follow-up on the problems identified.

Parent involvement was obtained by publicity, meetings and individual contact. Appointments were made for the parent and child to visit the school on two occasions; initial or pre-registration in March, and at the September enrolment in school. Subsequent reporting by the teacher on the child's progress followed throughout the school year.

Assessment of the health status of each child was undertaken by trained staff of the Metro-Windsor Essex County Health Unit. Hearing and vision were tested, and these were supplemented by the taking of a history of past and present health conditions from the parent by the child's teacher. The follow-up of health problems was carried out by the Health Unit and the family physician or specialist.

In addition, an assessment of each child's speech was made by speech teachers in order to identify any speech deficits which might become serious impediments to the child's later performance in school. The treatment of such deficits was then set in progress through the services of the school board and associated other agencies.

Identification of the educational status of each child was done by the teacher at the time of enrolment in school in September. Individual appointments were made for the parent and child prior to the class meeting as a whole. Testing was done at the rate of approximately eight appointments per day and was well received by parents. The child benefited by personal contact with the teacher and enjoyed a pleasant introduction to the school environment.

The status of the child's educational skills at that time in receptive language, auditory association, expressive language, number concepts and the recognition of colours was determined by the teacher using a battery of tests for which reliability had been earlier established. The scores obtained by the child on each of the assessments were recorded and converted into scaled scores to reflect low and high performers at that time.

The research indicated that children in Windsor schools were effectively identified by this methods so that the teacher, with assistance when necessary from Primary Division consultants and Special Education staff, could undertake the development of individual programs for both the low performing and gifted children.

The children were followed throughout the kindergarten year, and a test for readiness to read was administered by the teacher at the end of that year to assist in the subsequent placement of the child. The continuing progress of each participant in the project was monitored through grades one, two, and three, so that the continuing children from the original full sample provided the data for the study which is described later in this paper.

An important aspect of the original W.E.I.P. was the simplified method of recording all information obtained for the use of the teacher and the development of a continuous record of a child's progress. The latter procedure was put into operation by the Computer Services of the Windsor Board (with parental consent) for the retention of educational assessment and progress information. These records are available to parents on request; otherwise, strict confidentiality is maintained.

Essentially the current study considered two major points: (1) the possible use of the W.E.I.P. as an identification procedure for junior kindergarten, and (2) the current performance of the original W.E.I.P. as measured by the effectiveness of the predictions made on the progress of the children identified in the 1975 study. Thus, the report which follows is presented in two sections; one dealing with the W.E.I.P. in senior kindergarten, the other considering the original sample's progress to grade three.

THE W.E.I.P. IN SENIOR KINDERGARTEN

Initially, a sample of sixty-four junior kindergarten children participated in the testing which was conducted by a single trained tester using a W.E.I.P. kit and a standard procedure. Testing proceeded over a one-month period in the spring term of 1979. Each child was tested individually, and appropriate modification in the acceptability of the answers was permitted. Reliability checks were made by using split-half and test-retest approaches after a two-day delay. As will be noted, these proved to be indicative of difficulty. Subsequently, a modified W.E.I.P. was tested on fifty additional children. Results obtained indicated several problems with the approach taken.

The assessment battery of the W.E.I.P. is not an effective tool for use in the junior kindergarten in academic assessment. No problem was found, however, in using the materials other than the assessment battery. The parent report forms were found to be quite effective, and all other non-child produced data are most adequate. The basic problem encountered was the children's inability to appropriately respond to the test materials. It proved very difficult indeed to obtain any consistency in the answers of the children, even though actual scaled scores approached an expected mean. Very few children scored high on the scales, and a disproportionate number (by kindergarten standards) were at the "at risk" level.

Reliability figures showed a very disappointing split-half coefficient of .34 which clearly reflected the view of the tester that the majority of the children were not taking the test as designed, but were scoring on chance or other variability factors. Test-retest figures were equally low, as all reliability coefficients failed to reach .4. This is in sharp contrast to the W.E.I.P. in which reliability was consistently high.

The low reliability made any validity factors unobtainable, since reliability of a sufficient level (at least .6) is required for meaningful assessment. Consequently, it must be concluded that the

Assessment Battery of the W.E.I.P., as it is currently structured, is not suitable for use in the early months of junior kindergarten.

When a modified version, reducing the number and range and simplifying the language of the original questions was developed, it too failed to produce responses that could be relied upon to provide a fair assessment of children tested. Reliability coefficients again failed to reach .4 on either split-half or test-retest calculations (O'Bryan, 1979).

Several reasons can be suggested for the failure of either the current or the modified version of the Assessment Battery of the W.E.I.P. in junior kindergarten.

The W.E.I.P. was formulated expressly for older children, taking into account their developmental and experiential level, and matching those variables to the expected activity and educational demands of the kindergarten years. It was designed by kindergarten specialists for use with kindergarten entrants. The language used was suitable to five year olds, not four year olds, and the concepts involved presupposed knowledge of and exposure to activities and ideas up to and including the fifth year of life, so that a normally developing and educationally able child of five could score at least at the mean. It achieved its high reliability because it was appropriate to its target audience. It failed to achieve reliability with the four year olds perhaps because it was inappropriately designed for their experiences.

A second reason has to do with the nature of the performance being predicted to. The W.E.I.P. had, as its criterion, performance in the kindergarten year, a year which is structurally quite different from junior kindergarten. Junior kindergarten places much less academic demand on its children. Most of the experience is psychosocial and psychomotor, and it is clear that such a program demands pre-testing of a similar type if any attempt to predict performance is to have even minimal chance of success. It would seem, therefore, that a substantially redesigned assessment battery would be required to fairly test for learning difficulty identification facets in junior kindergarten.

THE W.E.I.P. AND THE ORIGINAL SAMPLE

The basic requirements for the second section of the study (the current status of the W.E.I.P.) were as follows:

(a) To examine the longer term validity and reliability of the W.E.I.P. procedures, including the performance testing, the medical and social histories and the teacher evaluations.

(b) To assess the relationships between the major extremes of identification (High Risk/High Performance) of children in the final year of the project (1974-1975) and their performance in grades one, two and three. The purpose of this procedure was to examine and refine the longer-term prediction and identification capacity of the procedure.

(c) To analyze the performance of the children who were identified as potentially high risk and whose subsequent school record resulted in referrals to psychological or special class treatment. This required a case study approach and was intended to serve as a basis for development of correlated treatment packages for use with the early identification procedures.

(d) To examine the feasibility and adaptations necessary to assess the W.E.I.P. procedures for use in junior kindergarten or in subsequent modified applications.

The study employed two basic research methodologies:

(a) A revisit to the computerized records of the children involved in the project; and

(b) A case study analysis of all referrals to any form of special or extra treatment.

All continuing records of the children included in the final year of the W.E.I.P. are held in the computer storage of the Windsor Board of Education. Continuous testing in reading, math, language, and behavioural variables has been conducted according to the approaches laid down in the original study.

The following procedures were employed to analyze these data:

(a) Prediction correlation beginning in kindergarten 1974 to the end of 1978 in terms of High Risk/High Performance children on all W.E.I.P. variables as the contributing variables with dependent variables being performance scores at the completion of reading readiness through grade three; these dependent variables included reading, language, math, psychological adjustment, attention; and other factors including allergies, speech, vision, and hearing.

(b) Case studies of all referrals to special services. Historical analysis of all data, but primarily performance and behavioural information obtained during kindergarten W.E.I.P. testing and followed during reading readiness through grade three.

(c) Collection of information on teacher-based in-classroom intervention programs for identified children.

There seems little question that the W.E.I.P. has performed remarkably well in the task of assessing children at risk in the first year of formal education. It has been equally successful in indicating children likely to do very well in school.

The Assessment Battery maintained a high degree of predictability of subsequent performance based upon teacher assessments of the children's work.

Performance on the various assessment tests of reading and mathematics in each of the three years was analyzed for all 1974/75 children currently remaining in the Windsor system. Four hundred and sixty-five cases were available for study, and the data indicate that the prediction of performance was very accurate to the end of grade one, exceeding eighty-four percent in all categories. But this falls somewhat to the order of eighty percent in grade two, and to approximately seventy-five percent accuracy at grade three. All cases are highly significant statistically ($\rho < .001$), and there can be little doubt that the W.E.I.P. is a very powerful early identification package.

The data obtained from children still in the Windsor system suggest that the multiple linear regression prediction of the full assessment battery to each of the criteria ranges between .45 and .69 over the three years. All of these correlations are highly significant statistically and suggest that the W.E.I.P. is a stable and valid predictor of learning difficulty in the elementary school years. However, the referral to special education of children at high risk and the effect of deficit recovery from English as a second language have served to reduce these correlations somewhat; consequently, they should be regarded as least estimates of the power of the test to accurately predict performance.

The data clearly show the very high stability of the W.E.I.P. upper end scores and give very good long-term grounds for believing the procedure to be an excellent predictor of success in the early grades in school.

REFERENCES

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MONITORING THE CHILD'S LEARNING STYLE

Dr. Denis H. Stott

The contributions to this Symposium have shown an encouraging consensus in endorsing a new approach, not only to the identification of children likely to have problems but also to learning and teaching in general. This new approach can be summarized under four headings.

First, we are abandoning the deficit concept--that is to say, the presumed existence of "learning disabilities" in the form of inborn developmental anomalies.

Second--and this follows from the first--in setting out to identify the at-risk children, we are concerned with all those who are likely to run into difficulties, and not only the few who have been presumed to have special learning disabilities.

Third, the only legitimate purpose of early identification procedures is the discovery of the at-risk children with a view to eliminating or reducing the risk of their failure. Identification makes no sense unless it gives a prescription, and is followed by the appropriate remediation and preventive measures. This means not merely spotting the children likely to fail, but spotting the reasons for their failure.

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* Dr. Stott, formerly Director of the Centre for Educational Disabilities, University of Guelph, Ontario, has worked extensively in the field of assessment.

Fourth--and this is the point that has pleased me most--speaker after speaker, beginning with Virginia Shipman--has stressed the way s/he sets about learning as the critical factor during the child's early years, that is to say, his/her learning style.

In short, we should not get involved in statistical exercises in prediction for its own sake. If we go out to achieve the most accurate prediction we get led into an educational blind alley. For the prediction of any type of attainment, that which gives the best result in statistical terms is the level of attainment already achieved. Early identification techniques which test the ability of school entrants to name colours, count, recognize pictures, and so on, fall into this trap. Naturally the primary teacher will need to monitor his/her children's progress in these attainments, but they only tell us which children are on the road to success or failure, not why their attainment is likely to be good or poor.

What, then, can we say about the why and the wherefore of poor attainment? First, as teachers we have to struggle to free our minds from that traditional let-out and excuse for giving up on a child, the assumption of a deficit of intelligence. Sometimes, in discussing a child's learning difficulties with me, a teacher has remarked, "I've come to the conclusion that he just hasn't got it in him."

We don't know what a child has got in him until we help him to bring it out--get his mind working, remove all those inhibitions which prevent a child using his mind and his perceptual powers. Let us cease to think negatively about limitations of intelligence and begin to think positively of developing capabilities.

We start by observing the child when faced with a learning task. We record his or her learning style. This was the point I had reached when I assumed the Directorship of the Centre for Educational Disabilities some twelve years ago. From my experience in remedial reading, I had noticed that the children who made the least progress were those who were setting about learning the wrong way, or were avoiding or setting up defences against the challenges of learning.

Any teacher can verify this finding by observing the behaviour of a few poor learners. What do we see?

Maybe the child is too restless and distractible or has never learned to focus his attention on educational material. He doesn't use his eyes or ears; he doesn't get the information needed for solving problems.

Maybe she is frightened of learning and of giving incorrect answers. She can think only of the prospect of failure, so that her mental processes become totally inhibited. To avoid being confronted with difficulties, she retreats into retardation. Most of our supposedly dull children are really suffering from this sort of temperamental handicap.

Maybe he has the opposite sort of temperament, reacting so quickly that he doesn't give his brain time to work out the answer. Because guessing leads to failure, he seeks refuge in distractibility and other evasive tactics.

These, and other false strategies, are handicaps of learning behaviour. They preclude learning, irrespective of the child's abilities. Nevertheless we must not think of them as irremovable handicaps. As we observe them, all we can say is that the child is using a particular faulty learning style. S/he may well be capable of using an effective one, but it lies dormant. Nearly all the young children referred to our Centre as perceptually handicapped just had not acquired the habit of visual attention. They could be taught to use their eyes in half-an-hour or so. In some children, on the other hand, their poor learning styles do reflect real handicaps of temperament which require long and painstaking remediation. We can discover the extent of a child's handicap only by working with him or her.

There are also important health reasons for poor learning--middle-ear disease, infected tonsils and adenoids, which poison a child's system and make him dull and listless; or physical defects such as those of eyesight and hearing; or lack of sleep in a disorganized home; or emotional disturbance due to family problems; or just a hyperactive mode of life in which fun consists of rough-and-tumble play and lack of attention to detail.

A child with any of these health or social handicaps finds that he cannot keep up with his peers. Becoming discouraged, he sets up defences against the prospect of continued failure. He becomes an avoider, either by distractibility or by hiding behind a mask of incompetence. Poor learning style becomes a telltale indicator of all sorts of handicaps.

In our Centre at Guelph, we spent some five years recording and classifying poor approaches to learning. The result was the *Guide to the Child's Learning Skills*. It is a diagnostic instrument describing, in three degrees of severity, fourteen different faulty approaches to learning.*

The full GCLS is not an early identification screening instrument. It diagnoses the type of faulty approach to learning in children who have already been identified as at-risk, as the basis for a remedial program. The actual identification is carried out by the *Preliminary Screening* sheet. It consists of seven short descriptions of the elements of *good* learning style, as follows:

The seven Preliminary Screening questions:

1. Shows by his answers that he is giving attention.

2. Settles down well at an activity that needs some concentration.

3. Copes with something new without getting nervous or upset.

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* Copies of the full GCLS are obtainable from Dr. D. H. Stott, 30 Colborn Street, Guelph, N1G 2M5, at a cost of 50¢. A licence to reproduce quantities is granted to qualified persons for a nominal fee.

4. Is willing to fall in with the general activities of the class.

5. Is willing to try on his own.

6. Accepts help when he cannot manage a task.

7. Is an alert child who enters into activities with interest.

The first results of a follow-up study covering over 2,000 children now in progress in Britain show that these mere seven questions are remarkably predictive of children's attainment in reading and arithmetic twelve months later. The merit of this technique is that it takes up very little of the teacher's time, it does not in the least interfere with the children's education, and--because no testing of children is involved--arouses no anxieties in parents.

I have no time in this report to more than mention the remedial program developed at the Centre for those children identified as having poor learning styles. It has been published under the name of the *Flying Start Learning-to-Learn Kits* (now available through SRA). They have four main objectives: to train the child in visual attention, to teach confidence, to encourage reflectivity, and to demonstrate the value of a methodical approach to problem-solving. The training is built into games in a way that the adoption of a good learning approach brings success and is consequently reinforced. Each activity is self-correcting, so that the teacher is free to observe and to note each child's progress in learning skills.